

# San Francisco Bay Area Toll Bridge Seismic Retrofit and Regional Measure 1 Programs

## Project Progress and Financial Update May 2010



Released: June 2010





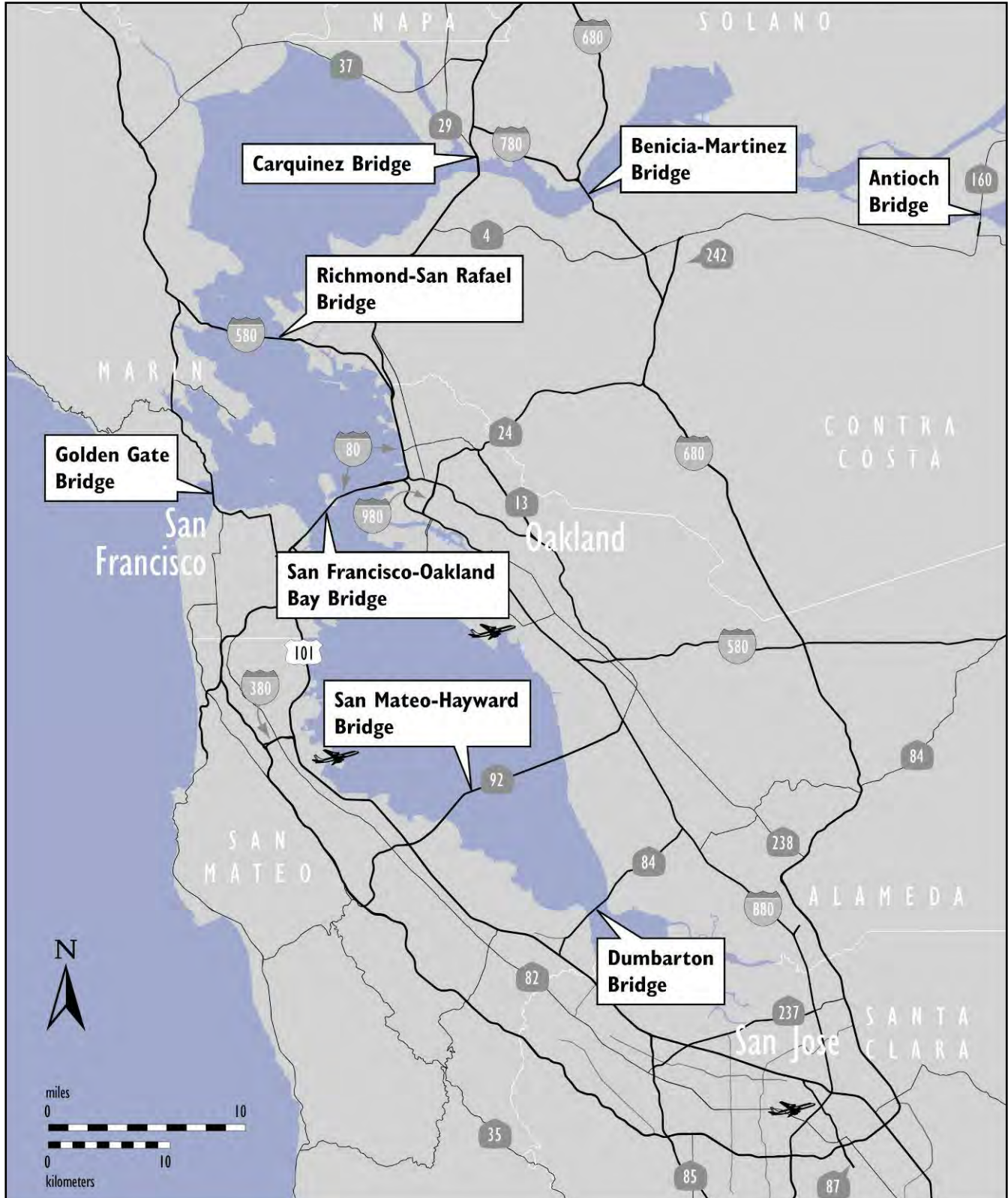
Yerba Buena Island Transition Structure Column Rebar Cage



# Table of Contents

<b>Introduction</b>	<b>1</b>
Summary of Major Project Highlights, Issues, and Actions	2
Toll Bridge Seismic Retrofit Program Cost Summary	6
Toll Bridge Seismic Retrofit Program Schedule Summary	7
Regional Measure 1 Program Cost Summary	8
Regional Measure 1 Program Schedule Summary	9
<b>Toll Bridge Seismic Retrofit Program (TBSRP)</b>	<b>11</b>
San Francisco-Oakland Bay Bridge Seismic Retrofit Strategy	12
San Francisco-Oakland Bay Bridge East Span Replacement Project Summary	15
Yerba Buena Island Detour (YBID)	16
Yerba Buena Island Transition Structures (YBITS)	18
Self-Anchored Suspension (SAS) Bridge	20
SAS Construction Sequence	22
SAS Superstructure Fabrication Activities	24
SAS Superstructure Field Activities	27
SAS Superstructure Installation Activities	28
Skyway	30
Oakland Touchdown (OTD)	31
Other Contracts	32
Antioch Bridge Seismic Retrofit Project	34
Dumbarton Bridge Seismic Retrofit Project	35
Other Completed TBSRP Projects	36
<b>Regional Measure 1 (RM1) Toll Bridge Program</b>	<b>39</b>
Interstate 880/State Route 92 Interchange Reconstruction Project	40
Other Completed RM1 Projects	42
<b>Appendices</b>	<b>44</b>

## Map of Bay Area Toll Bridges



\* The Golden Gate Bridge is owned and operated by the Golden Gate Bridge, Highway, and Transportation District.



## Introduction

In July 2005, Assembly Bill (AB) 144 (Hancock) created the Toll Bridge Program Oversight Committee (TBPOC) to implement a project oversight and project control process for the Benicia-Martinez Bridge and State Toll Bridge Seismic Retrofit Program projects. The TBPOC consists of the Caltrans Director, the Bay Area Toll Authority (BATA) Executive Director and the Executive Director of the California Transportation Commission (CTC). The TBPOC's project oversight and control processes include, but are not limited to, reviewing bid specifications and documents, providing field staff to review ongoing costs, reviewing and approving significant change orders and claims in excess of \$1 million (as defined by the Committee) and preparing project reports. AB 144 identified the Toll Bridge Seismic Retrofit Program and the new Benicia-Martinez Bridge Project as being under the direct oversight of the TBPOC.

On October 11, 2009, Governor Schwarzenegger approved Assembly Bill 1175 that added the Dumbarton and Antioch Bridges to the Toll Bridge Seismic Retrofit Program. A toll increase on the Bay Area's seven state-owned toll bridges will go into effect on July 1, 2010, in part, to fund the seismic retrofit of the Dumbarton and Antioch bridges. The current status of the Toll Bridge Seismic Retrofit Program is as follows:

Toll Bridge Seismic Retrofit Projects	Seismic Safety Status
Dumbarton Seismic Retrofit Project	Advertised
Antioch Bridge Seismic Retrofit	Awarded
San Francisco-Oakland Bay Bridge East Span Replacement	Construction
San Francisco-Oakland Bay Bridge West Approach Replacement	Complete
San Francisco-Oakland Bay Bridge West Span Seismic Retrofit	Complete
San Mateo-Hayward Bridge Seismic Retrofit	Complete
Richmond-San Rafael Bridge Seismic Retrofit	Complete
1958 Carquinez Bridge Seismic Retrofit	Complete
1962 Benicia-Martinez Bridge Seismic Retrofit	Complete
San Diego-Coronado Bridge Seismic Retrofit	Complete
Vincent Thomas Bridge Seismic Retrofit	Complete

The new Benicia-Martinez Bridge is part of a larger program of toll-funded projects called the Regional Measure 1 (RM1) Toll Bridge Program under the responsibility of BATA and Caltrans. While the rest of the projects in the RM1 program are not directly under the responsibility of the TBPOC, BATA and Caltrans will continue to report on their progress as an informational item. The RM1 program includes:

Regional Measure 1 Projects	Open to Traffic Status
Interstate 880/State Route 92 Interchange Reconstruction	Construction
New Benicia-Martinez Bridge	Open
Richmond-San Rafael Bridge Deck Overlay Rehabilitation	Open
Richmond-San Rafael Bridge Trestle, Fender & Deck Joint Rehabilitation	Open
Westbound Carquinez Bridge Replacement	Open
San Mateo-Hayward Bridge Widening	Open
State Route 84 Bayfront Expressway Widening	Open
Richmond Parkway	Open



## SUMMARY OF MAJOR PROJECT HIGHLIGHTS, ISSUES, AND ACTIONS



**SAS - Roadway Boxes Placed on Temporary Structures**



**SAS - Joining of Two Roadway Boxes**



**SAS - View of Eastbound Roadway Boxes Placed on the Temporary Structure**

### **Toll Bridge Seismic Retrofit Program Risk Management**

A major element of the 2005 AB144, the law creating the TBPOC, was legislative direction to implement a more aggressive risk management program. Such a program has been implemented in stages over time to ensure development of a robust and comprehensive approach to risk management. We have reached a milestone with our risk management program with all elements now fully incorporated, resulting in one of the most detailed and comprehensive risk management programs in the country today.

A comprehensive risk assessment is performed for each project in the program. Based upon those assessments, a forecast is developed using the average cost of risk. These forecasts can both increase and decrease as risks are identified, resolved or retired. Nonetheless, we want to ensure that the public is informed of the risks we have identified and the possible expense they could necessitate.

As of the end of the first quarter 2010, the 50 percent probable draw on program contingency is \$526 million with a potential draw that ranges from about \$300 million to \$700 million. The total current program contingency budget is \$948 million, which was recently increased by \$190 million with the inclusion of the Antioch Bridge and Dumbarton Bridge retrofits into the Toll Bridge Seismic Retrofit Program (TBSRP).

Given the current program contingency budget balance, there are sufficient funds to cover the cost of identified risks. Risk mitigation actions are continuously being developed and implemented to reduce the potential draw on the contingency.

### **San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Replacement Project**

#### **SAS Superstructure Contract**

The prime contractor constructing the Self-Anchored Suspension (SAS) Bridge from the completed Skyway to Yerba Buena Island is a joint venture of American Bridge/ Fluor (ABF). Significant progress is being made both here in the Bay Area and around the world. The first 12 of 28 steel roadway boxes have arrived with 11 already having been lifted into place. These boxes, fabricated in





**SFO Bay Bridge Detour Structure Completed over the Labor Day Weekend**

Shanghai, China, join other bridge components that have been arriving from around the country and the world. Shipments of roadway and tower boxes will continue throughout the year. The first shipment of tower boxes, the longest and heaviest sections, is expected to arrive this summer. All bridge components undergo a rigorous quality review by the fabricator, ABF, and Caltrans to ensure that only bridge components that have been built in accordance to the specifications will be shipped.

On the critical path to completing the bridge is the fabrication of the last roadway sections at the east end of the new span, which unfortunately are also the most complex to fabricate. Furthermore, the start of fabrication of these segments has fallen behind schedule due to delays in the fabrication drawing preparation process. While steps have been taken to ensure completion of the shop drawings, efforts are now focused on accelerating the fabrication of the boxes.

With the goal of achieving seismic safety by moving traffic off the old bridge and onto the new as soon as possible, all risk-mitigating options to get the new bridge open to traffic by our 2013 target are being explored. One option being discussed is a “seismic safety opening” of the bridge to traffic before non-essential structural and traffic systems are completed, like architectural lighting or removal of unneeded temporary support structures. Updates on the progress of the project will continue to be reflected in subsequent reports.

Caltrans has established risk management teams to identify and evaluate our challenges and future potential risks to completing the project on time and on budget. In particular, teams are reviewing cable-erection plans and mitigation actions. Based on the latest risk management assessment, there is a potential for a \$238 million increase on the SAS contract.

### **Yerba Buena Island Detour Contract**

The Yerba Buena Island Detour contractor, C.C. Myers, has rolled out the existing bridge span and rolled in the new east tie-in span of the detour structure that diverts traffic off the existing bridge to the detour structure that now ties into the Yerba Buena Island Tunnel. The traffic switch occurred as scheduled on Labor Day weekend. Work is now progressing on the demolition of the old approach span and construction of a number of accelerated foundations for the future transition structures from the Self-Anchored Suspension (SAS) bridge to the tunnel. Upon removal of the old approach span, the area will be turned over to the Yerba Buena Island Transition Structures (YBITS) #1 contractor that will construct the new approach structures.

### **Yerba Buena Island Transition Structures #1 Contract**

The YBITS#1 contract has been awarded to MCM Construction, the same contractor completing the Oakland Touchdown (OTD) #1 contract. Construction will not start until the demolition of the existing approach has been completed. Caltrans and the contractor are in the submittal and planning process for the contract.



## SUMMARY OF MAJOR PROJECT HIGHLIGHTS, ISSUES, AND ACTIONS



Oakland Touchdown #1 Bike Path Railing



Oakland Touchdown # 1 Trestle Removed and Equipment Service Platforms Installed



Mock-Up of Dumbarton/Antioch Pier Columns Undergoing Seismic Testing

### Oakland Touchdown #1 Contract

The Oakland Touchdown (OTD) #1 contractor, MCM Construction, continues to be on schedule with a forecast completion date of June 2010. The contract constructs the westbound approach from the toll plaza to the skyway structure and the portion of the eastbound approach that is not in conflict with the existing bridge structure. The remaining approach work will be completed by a future OTD #2 contract.

### TBSRP Capital Outlay Support

Based on initial discussions with our contractors, early completion of the East Span Project was believed to be possible and sufficient to mitigate potential identified support cost increases. The support cost increases are primarily due to the need to re-advertise the SAS contract and to decisions made to increase our opportunities for early completion of the East Span Project. These decisions include a 12-month schedule extension provided during bid time to attract the maximum number of bidders for the SAS contract and extension of the YBI Detour contract to advance future foundation and column work of the transition structure and west-end deck reconstruction. Since we now judge early completion and the intended cost savings to be unlikely, we forecast a potential drawdown of \$303 million from the program contingency for project support. While the TBPOC will continue to seek opportunities to economize in this area, a budget change will be necessary.

### TBSRP Programmatic Risks

This category includes risks that are not yet scoped within existing contracts and/or that spread across multiple contracts. The interdependencies between all of the contracts in the program result in the potential for one contract's delay to impact the other contracts.



Antioch Bridge



Dumbarton Bridge

## Dumbarton Bridge Seismic Retrofit

When first conceived, the Toll Bridge Seismic Retrofit Program only identified seven of the nine state owned toll bridges to be in need of seismic retrofit, which excluded the Dumbarton and Antioch Bridges. Further seismic vulnerability studies completed by Caltrans and BATA on those structures determined that both structures were in need of retrofit based on current seismic standards.

On October 11, 2009, Governor Schwarzenegger signed Assembly Bill 1175, which added the Dumbarton and Antioch Bridges to the Toll Bridge Seismic Retrofit Program. In part to fund these seismic retrofits, a toll increase on the seven state-owned toll bridges in the Bay Area will go into effect on July 1, 2010. The Dumbarton Bridge Seismic Retrofit Contract was advertised in March and bid opening is scheduled for mid June 2010.

## Antioch Bridge Seismic Retrofit

Bids for the Antioch Bridge Retrofit Contract were opened on March 10, 2010. The contract was awarded to California Engineering Contractors, Inc. on April 22, 2010. The awarded contract was significantly less than the engineer's estimate for the work and has resulted in a significant cost forecast reduction. The TBPOC is recommending that the budget for the project be reduced to account for the low bid. The original budget for the project was \$267 million. Because of the low bid, the TBPOC is forecasting a need of only \$130 million. The retrofit is forecast to be completed by May 2012.

## Regional Measure 1 Toll Bridge Program (RM1)

### Interstate 880/State Route 92 Interchange Reconstruction Project

On this interchange reconstruction project, the new eastbound State Route 92 to northbound Interstate 880 direct connector structure (ENCONN) was completed and opened to detour traffic on May 16, 2009. Caltrans plans to open the southern half of the separation structure to detour traffic to allow for construction of the remaining northern half of the structure in April 2010. The project is forecast to be substantially completed as planned in June 2011, pending weather or unforeseen construction delays.



Site Preparation for New Route 92 and Interstate 880 Separator



## Toll Bridge Seismic Retrofit Program Cost Summary

	Contract Status	AB 144/SB 66 Budget (July 2005)	TBPOC Approved Changes	Current TBPOC Approved Budget (April 2010)	Cost to Date (April 2010)	Current Cost Forecast (April 2010)	Cost Variance	Cost Status
		a	b	c = a + b	d	e	f = e - c	
<b>SFOBB East Span Seismic Replacement</b>								
Capital Outlay Construction								
Skyway	Completed	1,293.0	(38.9)	1,254.1	1,236.9	1,254.1	-	●
SAS Marine Foundations	Completed	313.5	(32.6)	280.9	274.8	280.9	-	●
SAS Superstructure	Construction	1,753.7	-	1,753.7	1,021.2	1,991.4	237.7	●
YBI Detour	Construction	132.0	360.9	492.9	436.0	486.3	(6.6)	●
YBI Transition Structures (YBITS)		299.3	(93.0)	206.3	1.8	220.2	13.9	●
YBITS 1	Construction			144.0	1.8	156.9	12.9	●
YBITS 2	Design			59.0	-	60.0	1.0	●
YBITS Landscaping	Design			3.3	-	3.3	-	●
Oakland Touchdown (OTD)		283.8	4.2	288.0	207.4	283.0	(5.0)	●
OTD 1	Construction			212.0	199.5	211.2	(0.8)	●
OTD 2	Design			62.0	-	57.8	(4.2)	●
OTD Electrical Systems	Design			4.4	-	4.4	-	●
Submerged Electric Cable	Completed			9.6	7.9	9.6	-	●
Existing Bridge Demolition	Design	239.2	(0.1)	239.1	-	232.4	(6.7)	●
Stormwater Treatment Measures	Completed	15.0	3.3	18.3	16.7	18.3	-	●
Other Completed Contracts	Completed	90.3	-	90.3	89.2	90.3	-	●
Capital Outlay Support		959.3	-	959.3	835.7	1,262.2	302.9	●
Right-of-Way and Environmental Mitigation		72.4	-	72.4	51.2	72.4	-	●
Other Budgeted Capital		35.1	(3.3)	31.8	0.7	7.7	(24.1)	●
<b>Total SFOBB East Span Replacement</b>		<b>5,486.6</b>	<b>200.5</b>	<b>5,687.1</b>	<b>4,171.6</b>	<b>6,199.2</b>	<b>512.1</b>	
<b>Antioch Bridge Seismic Retrofit</b>								
Capital Outlay Construction and Mitigation	Construction	-	156.0	156.0	-	70.0	(86.0)	●
Capital Outlay Support		-	39.0	39.0	15.4	31.0	(8.0)	●
<b>Total Antioch Bridge Seismic Retrofit</b>		<b>-</b>	<b>195.0</b>	<b>195.0</b>	<b>15.4</b>	<b>101.0</b>	<b>(94.0)</b>	
<b>Dumbarton Bridge Seismic Retrofit</b>								
Capital Outlay Construction and Mitigation	Advertised	-	270.0	270.0	0.3	171.9	(98.1)	●
Capital Outlay Support		-	95.0	95.0	-	103.1	8.1	●
<b>Total Dumbarton Bridge Seismic Retrofit</b>		<b>-</b>	<b>365.0</b>	<b>365.0</b>	<b>21.7</b>	<b>275.0</b>	<b>(90.0)</b>	
<b>Other Program Projects</b>		<b>2,268.4</b>	<b>(58.8)</b>	<b>2,209.6</b>	<b>2,158.0</b>	<b>2,192.6</b>	<b>(17.0)</b>	●
<b>Miscellaneous Program Costs</b>		<b>30.0</b>	<b>-</b>	<b>30.0</b>	<b>24.8</b>	<b>30.0</b>	<b>-</b>	●
<b>Net Programmatic Risks</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>78.0</b>	<b>78.0</b>	●
<b>Program Contingency</b>		<b>900.0</b>	<b>48.3</b>	<b>948.3</b>	<b>-</b>	<b>422.2</b>	<b>(526.1)</b>	●
<b>Total Toll Bridge Seismic Retrofit Program</b>		<b>8,685.0</b>	<b>750.0</b>	<b>9,435.0</b>	<b>6,391.5</b>	<b>9,298.0</b>	<b>(137.0)</b>	●
● Within approved schedule and budget ● Identified potential project risks that could significantly impact approved schedules and budgets if not mitigated ● Known project impacts with forthcoming changes to approved schedules and budgets								

## Toll Bridge Seismic Retrofit Program Schedule Summary

	AB144/SB 66 Project Completion Schedule Baseline (February 2005)	TBPOC Approved Changes (Months)	Current TBPOC Approved Completion Schedule (April 2010)	Current Completion Forecast (April 2010)	Schedule Variance (Months)	Schedule Status	Remarks/Notes
	g	h	i = g + h	j	k = j - i	l	
<b>SFOBB East Span Seismic Replacement</b>							
Contract Completion							
Skyway	Apr 2007	8	Dec 2007	Dec 2007	-	●	See Page 30
SAS Marine Foundations	Jun 2008	(5)	Jan 2008	Jan 2008	-	●	See Page 20
SAS Superstructure	Mar 2012	12	Mar 2013	Oct 2013	7	●	See Page 24
YBI Detour	Jul 2007	41	Dec 2010	Dec 2010	-	●	See Page 17
YBI Transition Structures (YBITS)	Nov 2013	12	Nov 2014	Mar 2015	4		See Page 18
YBITS 1			Sep 2013	Dec 2013	3	●	
YBITS 2			Nov 2014	Mar 2015	4	●	
YBITS Landscaping			TBD	TBD	-	●	
Oakland Touchdown	Nov 2013	12	Nov 2014	Mar 2015	4		See Page 31
OTD 1			May 2010	June 2010	1	●	
OTD 2			Nov 2014	Mar 2015	4	●	
OTD Electrical Systems			TBD	TBD	-	●	
Submerged Electric Cable			Jan 2008	Jan 2008	-	●	
Existing Bridge Demolition	Sep 2014	12	Sep 2015	Dec 2015	3	●	
Stormwater Treatment Measures	Mar 2008	-	Mar 2008	Mar 2008	-	●	
<b>SFOBB East Span Bridge Opening and Other Milestones</b>							
OTD Westbound Access			Aug 2009	Aug 2009	-	●	
YBI Detour Open			Sep 2009	Sep 2009	-	●	See Page 16
Westbound Open	Sep 2011	12	Sep 2012	April 2013	7	●	
Eastbound Open	Sep 2012	12	Sep 2013	Dec 2013	3	●	
<b>Antioch Bridge Seismic Retrofit</b>							
Contract Completion			Aug 2012	May 2012	(3)	●	See page 36
<b>Dumbarton Bridge Seismic Retrofit</b>							
Contract Completion			Sep 2013	Sep 2013	-	●	See Page 37

**Notes:** 1) Figures may not sum up to totals due to rounding effects.  
 2) TBSRP Forecasts for the Monthly Reports are generally updated on a quarterly basis in conjunction with quarterly risk analysis assessments for the TBSRP Projects.



## Regional Measure 1 Program Cost Summary

	Contract Status	BATA Baseline Budget (July 2005)	BATA Approved Changes	Current BATA Approved Budget (April 2010)	Cost to Date (April 2010)	Current Cost Forecast (April 2010)	Cost Variance	Cost Status
		a	b	c = a + b	d	e	f = e - c	
<b>Interstate 880/Route 92 Interchange Reconstruction</b>								
Capital Outlay Construction	Construction	94.8	60.2	161.0	95.0	161.0	-	●
Capital Outlay Support		28.8	34.6	63.4	53.1	63.4	-	●
Capital Outlay Right-of-Way		9.9	7.0	16.9	12.1	16.9	-	●
Project Reserve		0.3	3.4	3.7	-	3.7	-	
<b>Total I-880/SR-92 Interchange Reconstruction</b>		<b>133.8</b>	<b>111.2</b>	<b>245.0</b>	<b>160.2</b>	<b>245.0</b>	-	
<b>Other Completed Program Projects</b>		<b>1,978.8</b>	<b>182.6</b>	<b>2,161.4</b>	<b>2,086.2</b>	<b>2,161.4</b>	-	
<b>Total Regional Measure 1 Toll Bridge Program</b>		<b>2,112.6</b>	<b>293.8</b>	<b>2,406.4</b>	<b>2,246.4</b>	<b>2,406.4</b>	-	

- Within approved schedule and budget
- Identified potential project risks that could significantly impact approved schedules and budgets if not mitigated
- Known project impacts with forthcoming changes to approved schedules and budgets

## Regional Measure 1 Program Schedule Summary

	BATA Baseline Completion Schedule (July 2005)	BATA Approved Changes (Months)	Current BATA Approved Completion Schedule (April 2010)	Current Completion Forecast (April 2010)	Schedule Variance (Months)	Schedule Status	Remarks/Notes
	g	h	i = g + h	j	k = j - i	l	
<a href="#">Interstate 880/Route 92 Interchange Reconstruction</a>							
Contract Completion							
Interchange Reconstruction	Dec 2010	6	Jun 2011	Jun 2011	-	●	See Page 48

Notes: 1) Figures may not sum to totals due to rounding effects.







View of the Skyway from the Bay

# TOLL BRIDGE SEISMIC RETROFIT PROGRAM



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge Seismic Retrofit Strategy

When a 250-ton section of the upper deck of the East Span collapsed during the 7.1-magnitude Loma Prieta Earthquake in 1989, it was a wake-up call for the entire Bay Area. While the East Span quickly reopened within a month, critical questions lingered: How could the Bay Bridge—a vital regional lifeline structure—be strengthened to withstand the next major earthquake? Seismic experts from around the world determined that to make each separate element seismically safe on a bridge of this size, the work must be divided into numerous projects. Each project presents unique challenges. Yet there is one common challenge — the need to accommodate the more than 280,000 vehicles that cross the bridge each day.



Overview of the Completed West Approach Replacement Structure

#### West Approach Seismic Replacement Project

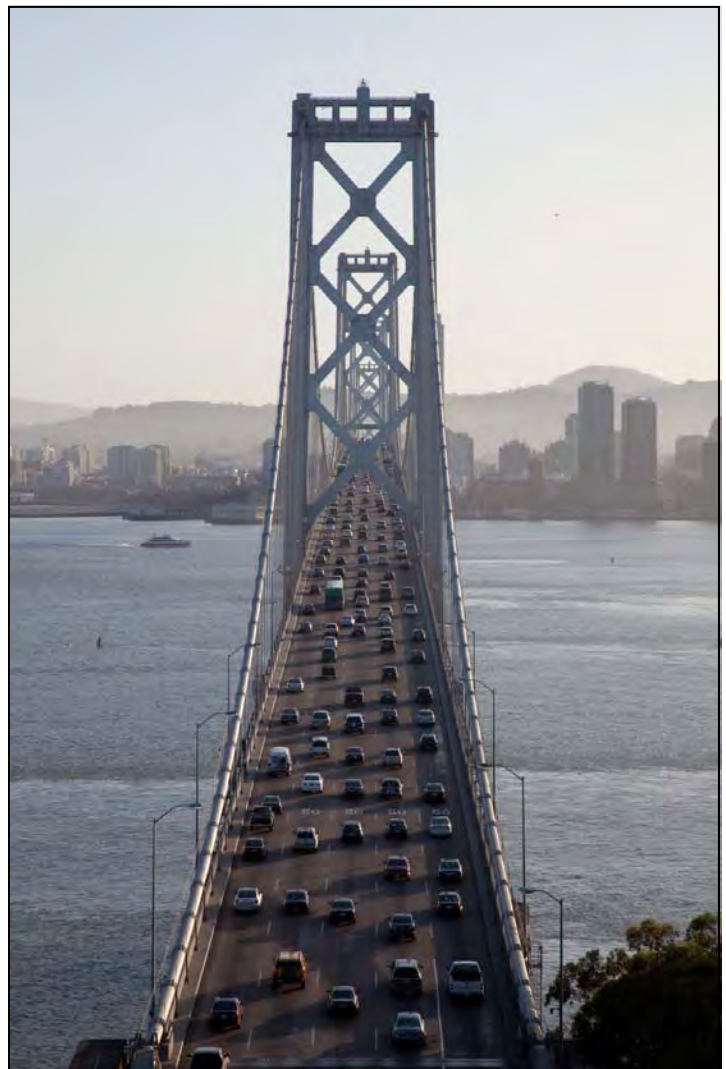
**Project Status: Completed 2009**

Seismic safety retrofit work on the West Approach in San Francisco—bounded on the west by 5th Street and on the east by the anchorage of the west span at Beale Street—involved completely removing and replacing this one-mile stretch of Interstate 80, as well as six on- and off-ramps within the confines of the West Approach's original footprint. This project was completed on April 8, 2009.

#### West Span Seismic Retrofit Project

**Project Status: Completed 2004**

The West Span lies between Yerba Buena Island and San Francisco and is made up of two complete suspension spans connected at a center anchorage. Retrofit work included adding massive amounts of steel and concrete to strengthen the entire West Span, along with new seismic shock absorbers and bracing.



West Span of the Bay Bridge

## East Span Seismic Replacement Project

Rather than a seismic retrofit, the two-mile-long East Span is being completely rebuilt. When completed, the new East Span will consist of several different sections, but will appear as a single streamlined span. The eastbound and westbound lanes of the East Span will no longer include upper and lower decks. The lanes will instead be parallel, providing motorists with expansive views of the bay. These views will also be enjoyed by bicyclists and pedestrians, thanks to a new path on the south side of the bridge that will extend all the way to Yerba Buena Island. The new span will be aligned north of the existing bridge to allow traffic to continue to flow on the existing bridge as crews build the new span.

The new span will feature the world's longest Self-Anchored Suspension (SAS) bridge that will be connected to an elegant roadway supported by piers (Skyway), which will gradually slope down toward the Oakland shoreline (Oakland Touchdown). A new transition structure on Yerba Buena Island (YBI) will connect the SAS to the YBI Tunnel and will transition the East Span's side-by-side traffic to the upper and lower decks of the tunnel and West Span.

When construction of the new East Span is complete and vehicles have been safely rerouted to it, the original East Span will be demolished.



Architectural Rendering of Skyway and the New Self-Anchored Suspension Bridge Looking Towards Yerba Buena Island





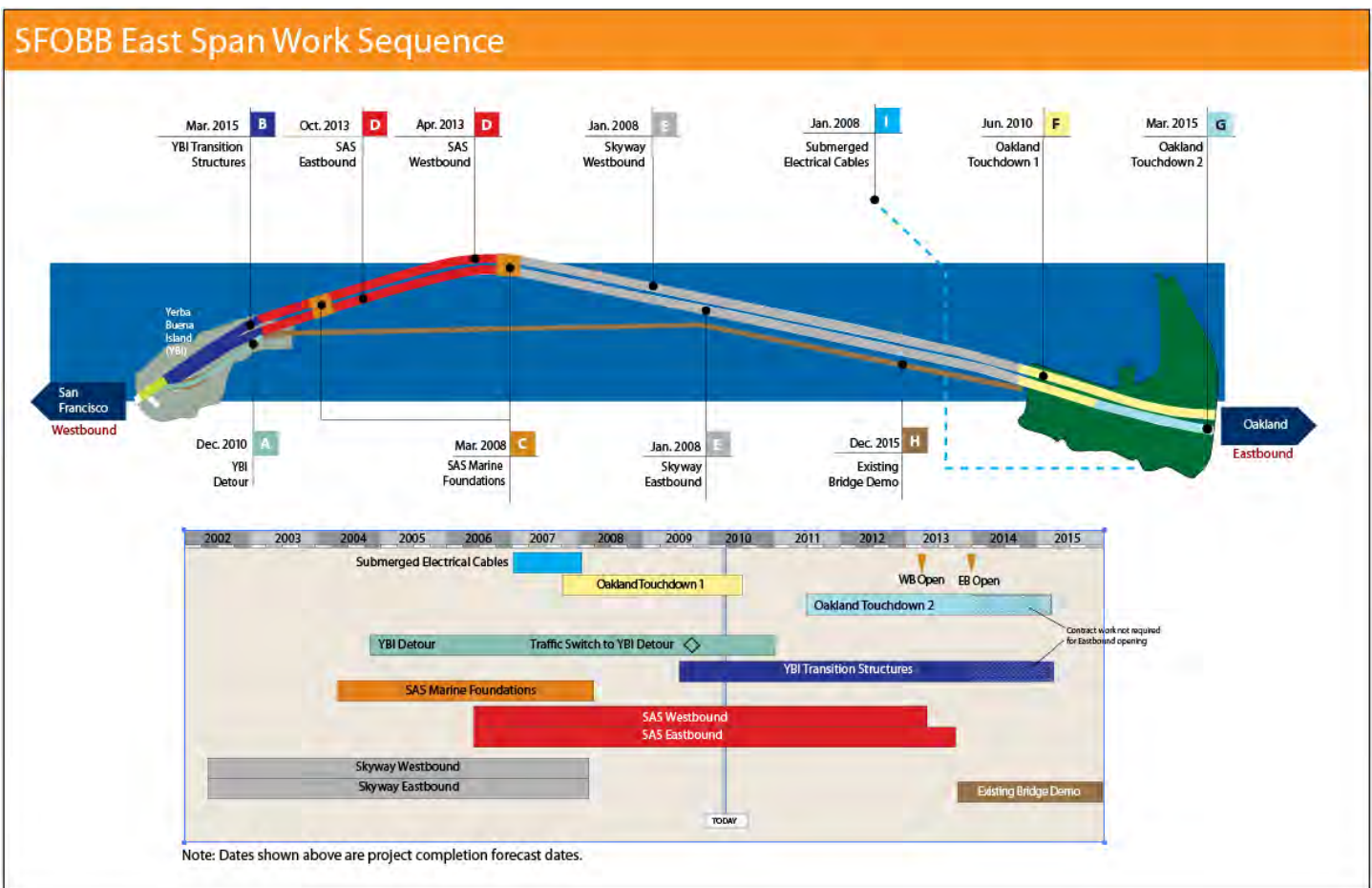
SAS Roadway Boxes and Crossbeams Installed

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Summary

The new East Span bridge can be split into four major components—the Skyway and the Self-Anchored Suspension bridge in the middle and the Yerba Buena Island Transition Structures and Oakland Touchdown approaches at either end. Each component is being constructed by one to three separate contracts that all have been sequenced together.

Highlighted below are the major East Span contracts and their schedules. The letter designation before each contract corresponds to contract descriptions in the report.





## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Yerba Buena Island Detour (YBID)

As with all of the Bay Bridge's seismic retrofit projects, crews must build the Yerba Buena Island Transition Structures (YBITS) without disrupting traffic. To accomplish this daunting task, YBID eastbound and westbound traffic was shifted off the existing roadway and onto a temporary detour on Labor Day weekend 2009. Drivers will use this detour, just south of the original roadway, until traffic is moved onto the new East Span.



Successful Labor Day Weekend 2007 Roll-In Structure to the Tunnel

#### **A** YBID Contract

Contractor: C.C. Myers Inc.

Approved Capital Outlay Budget: \$492.9 M

Status: 91% Complete as of April 2010

This contract was originally awarded in early 2004 to construct the detour structure for the planned 2006 opening of the new East Span. Due to the re-advertisement of the SAS superstructure contract in 2005 because of a lack of funding at the time, the bridge opening was rescheduled to 2013. To better integrate the contract into the current East Span schedule and to improve seismic safety and mitigate future construction risks, the TBPOC has approved a number of changes to the contract, including adding the deck replacement work near the tunnel that was rolled into place over Labor Day weekend 2007, advancing future transition structure foundation work and making design enhancements to the temporary detour structure. These changes have increased the budget and forecast for the contract to cover the revised project scope and potential project risks.

#### ***Tunnel Approach Roadway Replacement***

The first in a series of activities to open the detour viaduct was completed in 2007 with the replacement of a 350-foot-long stretch of upper-deck roadway just east of the Yerba Buena Island Tunnel. During this historic milestone, the entire Bay Bridge was closed over the 2007 Labor Day weekend so crews could demolish and replace the old section of the deck with a seismically upgraded 6,500-ton precast section of viaduct that was literally pushed into place (see photo above).

**Status:** Completed.

#### ***Detour Viaduct Fabrication and Construction***

The "S-Curve" detour viaduct runs parallel to the alignment of the old approach structure from the tunnel to the cantilever spans of the East Span. The viaduct looks quite similar to the structure it is replacing with steel cross beams and girders and upper and lower concrete roadway decks. The final 288-foot portion of the detour truss was rolled into place during a full bridge closure over Labor Day Weekend in 2009. Speed limits have been reduced on the viaduct to take the new alignment into account.

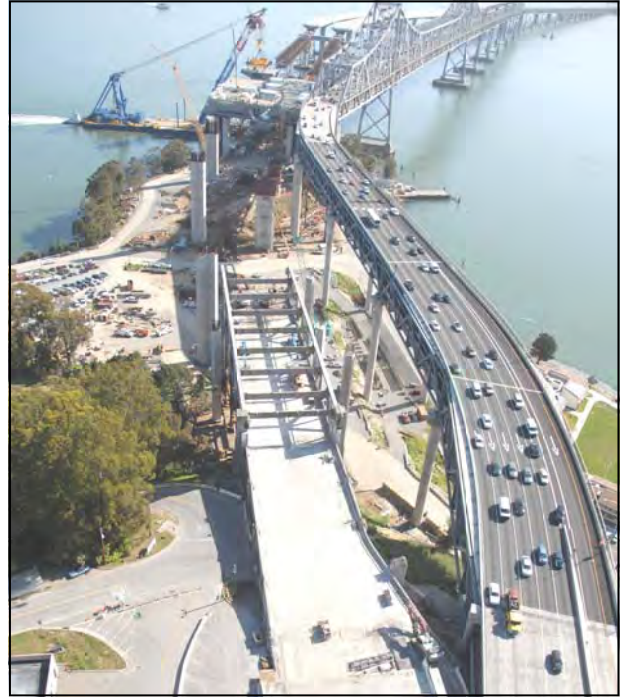
**Status:** Completed.



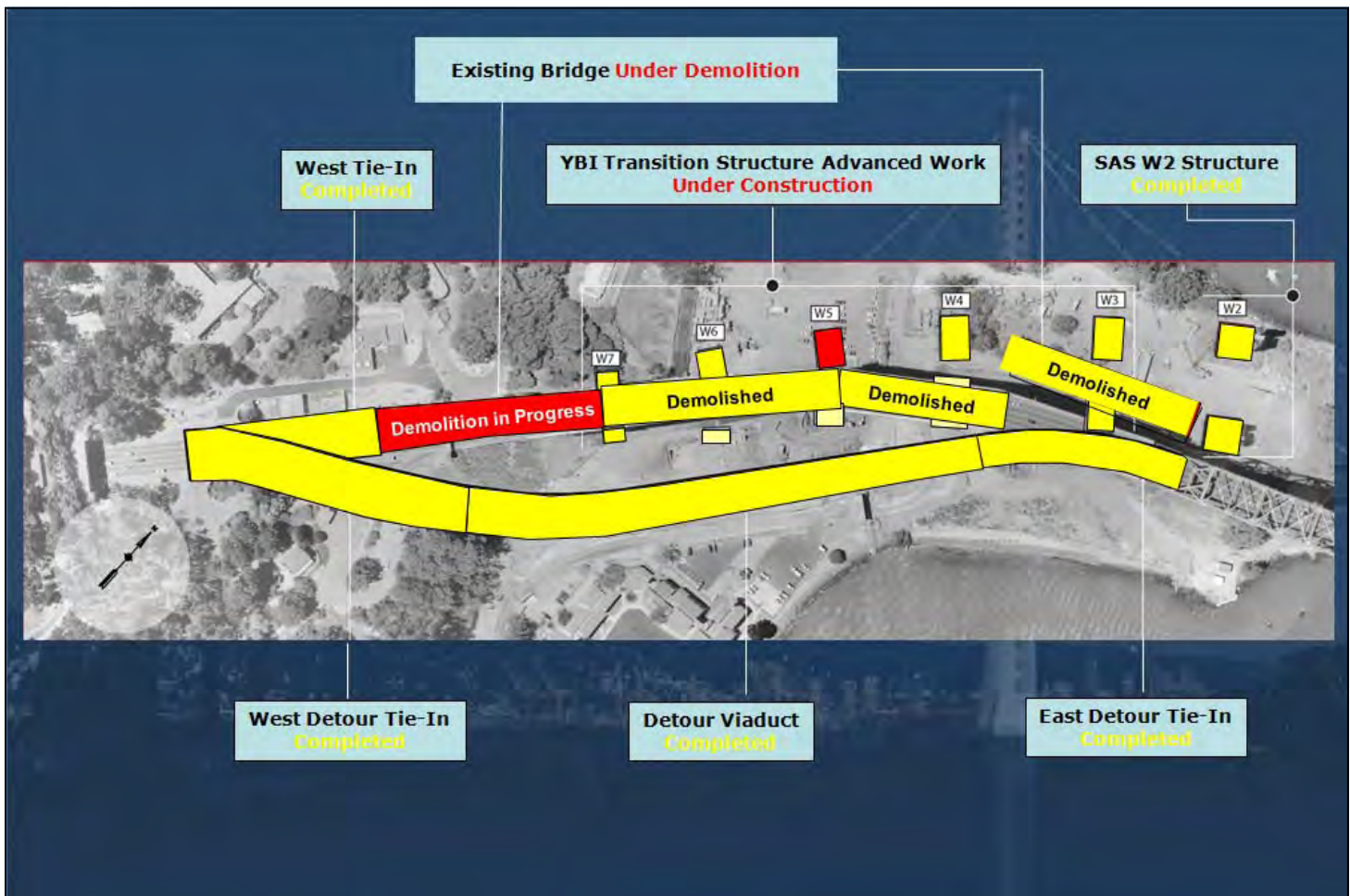
## Yerba Buena Island Detour (YBID) Traffic Shift and Existing Approach Bridge Demolition

To make way for the new bridge, the existing approach structure from the YBI tunnel to the cantilever spans of the East Span need to be demolished. After traffic was realigned onto the detour viaduct, demolition commenced on the removal of the approach structure. When completely removed, the Yerba Buena Island #1 contract will start construction on new approach structures from the tunnel to the SAS.

**Status:** Demolition of the existing approach structure has been ongoing since September 2009 and will be completed before the end of the year.



Demolition of Existing Bridge



Overview of Yerba Buena Island Detour Contract Scope of Work and Current Status

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Yerba Buena Island Transition Structures (YBITS)

The new Yerba Buena Island Transition Structures (YBITS) will connect the new SAS bridge span to the existing Yerba Buena Island Tunnel, transitioning the new side-by-side roadway decks to the upper and lower decks of the tunnel. The new structures will be cast-in-place reinforced concrete structures that will look very similar to the already constructed Skyway structures. While some YBITS foundations and columns have been advanced by the YBID contract, the remaining work will be completed under three separate YBITS contracts.

#### **B** YBITS #1 Contract

Contractor: **MCM Construction, Inc**

Current Capital Outlay Budget: **\$144.0 M**

Status: **In Construction**



Yerba Buena Island Transition Structure Advanced Columns

The YBITS #1 contract will construct the mainline roadway structures from the SAS bridge to the YBI tunnel. On December 15, 2009, Caltrans opened three bids for the Yerba Buena Island Transitions Structures (YBITS) #1 contract. On February 4, 2010, Caltrans awarded the YBITS #1 Contract to MCM Construction, Inc. Construction work will start when the YBID contractor has completed demolition of the old viaduct structure. MCM Construction, Inc. is also the firm constructing the Oakland Touchdown #1 contract.

**Status:** MCM Construction started work on submittals on March 10, 2010. Construction is scheduled to start on September 1, 2010.



Rendering of Overview of Future Yerba Buena Island Transition Structures (top), in progress with Detour Viaduct (bottom) Completed



## YBITS #2 Contract

Contractor: TBD

Current Capital Outlay Budget: \$59.0 M

Status: **In Design**

The YBITS #2 contract will demolish the detour viaduct after all traffic is shifted to the new bridge and will construct a new eastbound on-ramp to the bridge in its place. The new ramp will also provide the final link for bicycle/pedestrian access off the SAS bridge onto Yerba Buena Island.

## YBITS Landscaping Contract

Contractor: TBD

Current Capital Outlay Forecast: \$3.3 M

Status: **In Design**

Upon completion of the YBITS work, a follow-on landscaping contract will be executed to re-plant and landscape the area.

---

## ***Yerba Buena Island Transition Structures Advanced Work***

Due to the re-advertisement of the SAS superstructure contract in 2005, it became necessary to temporarily suspend the detour contract and make design changes to the viaduct. To make more effective use of the extended contract duration and to reduce overall project schedule and construction risks, the TBPOC approved the advancement of foundation and column work from the Yerba Buena Island Transition Structures contract.

**Status:** Advanced foundations and columns for piers W3, W5 and W7 are under construction. Foundation piling and footing for pier W5 has been completed and the first column lifts were placed on May 21, 2010. See page 17 for a diagram of pier locations.



Yerba Buena Island Transition Structures Advanced Columns



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Self-Anchored Suspension (SAS) Bridge

If one single element bestows world class status on the new Bay Bridge East Span, it is the Self-Anchored Suspension (SAS) bridge. This engineering marvel will be the world's largest SAS span at 2,047 feet in length, as well as the first bridge of its kind built with a single tower.

The SAS was separated into three separate contracts—construction of the land-based foundations and columns at Pier W2; construction of the marine-based foundations and columns at Piers T1 and E2; and construction of the SAS steel superstructure, including the tower, roadway, and cabling. Construction of the foundations at Pier W2 and at Piers T1 and E2 was completed in 2004 and 2007, respectively.

#### SAS Land Foundation Contract

Contractor: West Bay Builders, Inc.

Approved Capital Outlay Budget: \$26.4 M

Status: Completed October 2004

The twin W2 columns on Yerba Buena Island provide essential support for the western end of the SAS bridge, where the single main cable for the suspension span will extend down from the tower and wrap around and under the western end of the roadway deck. Each of these huge columns required massive amounts of concrete and steel and are anchored 80 feet into the island's solid bedrock.



SAS T1 Trestle Overview



SAS Overview of W2 Cap Beam

#### C SAS Marine Foundations Contract

Contractor: Kiewit/FCI/Manson, Joint Venture

Approved Capital Outlay Budget: \$280.9 M

Status: Completed January 2008

Construction of the piers at E2 and T1 required significant on-water resources to drive the foundation support piles down, not only to bedrock, but also through the bay water and mud (see rendering on facing page).

The T1 foundation piles extend 196 feet below the waterline and are anchored into bedrock with heavily reinforced concrete rock sockets that are drilled into the rock. Driven nearly 340 feet deep, the steel and concrete E2 foundation piles were driven 100 feet deeper than the deepest timber piles of the existing east span in order to get through the bay mud and reach solid bedrock.

## D SAS Superstructure Contract

Contractor: American Bridge/Fluor Enterprises, Joint Venture

Approved Capital Outlay Budget: \$1.75 B

Status: 51% Complete as of April 2010

The SAS bridge is not just another suspension bridge. Rising 525 feet above mean sea level and embedded in rock, the single-tower SAS span is designed to withstand a massive earthquake. Traditional main cable suspension bridges have twin cables with smaller suspender cables connected to them. These cables hold up the roadbed and are anchored to the east end of the box girders. While there will appear to be two main cables on the SAS, there will actually only be one. This single cable will be anchored within the eastern end of the roadway, carried over the tower and then wrapped around the two side-by-side decks at the western end.

The single steel tower will be made up of four separate legs connected by shear link beams which function much like a fuse in an electrical circuit. These beams will absorb most of the impact from an earthquake, preventing damage to the tower legs.

The next several pages highlight the construction sequence of the SAS and are followed by detailed updates on specific construction activities.



Architectural Rendering of New Self-Anchored Suspension Span and Skyway



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### *Self-Anchored Suspension (SAS) Construction Sequence*

#### STEP 1 - CONSTRUCT TEMPORARY SUPPORT STRUCTURES

Temporary support structures will need to be erected from the Skyway to Yerba Buena Island to support the new SAS bridge during construction.

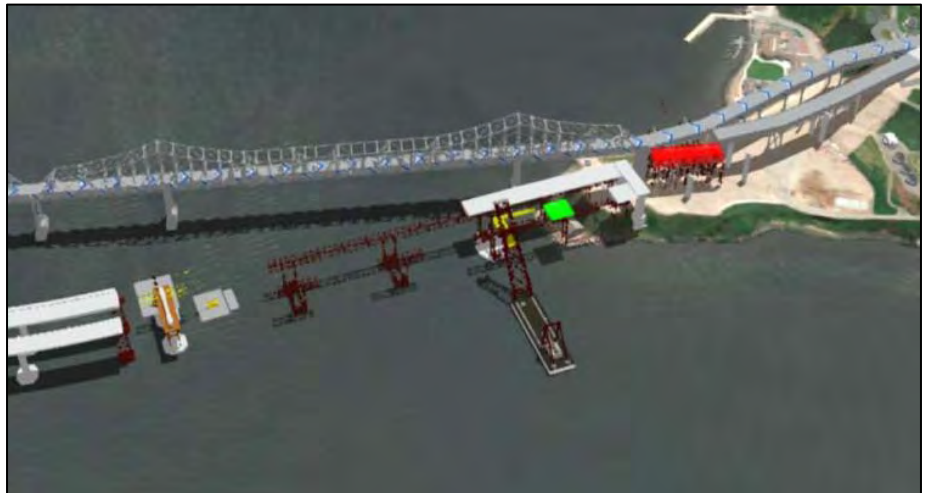
**Status:** Foundations and the temporary support structures are substantially complete.



#### STEP 2 - INSTALL ROADWAYS

The roadway boxes are being lifted into place by using the shear-leg crane barge. The boxes are being bolted and welded together atop the temporary support trusses to form two continuous parallel steel roadway boxes.

**Status:** The second shipment of roadway boxes arrived on April 18, 2010. Six eastbound and four westbound roadway boxes have been lifted into place and are being bolted and welded together. To date, five crossbeams have been erected between the roadway boxes. The third shipment is anticipated to arrive in July 2010.



#### STEP 3 - INSTALL TOWER

Each of the four legs of the tower will be erected in five separate lifts. The tower boxes will be installed using a temporary erection tower and lifting jacks.

**Status:** The first shipment of tower sections is anticipated on June 18, 2010 (see page 24 for more information).



#### STEP 4 - MAIN CABLE AND SUSPENDER INSTALLATION

The main cable will be pulled from the east end of the SAS bridge, over the tower, and wrapped around pier W2 and again back over the tower and to the west end of the SAS bridge deck. Suspenders cables will be added to lift the roadway decks off the temporary support structure.

**Status:** Cable installation is pending the erection of the tower and roadway spans. The first half of the cables arrived in January 2010, and the second half is being fabricated and anticipated to ship in the summer of 2010.



#### STEP 5 - WESTBOUND OPENING

The new bridge will first open in the westbound direction pending completion of the Yerba Buena Island Transition Structures.

**Status:** Westbound opening is forecast for summer 2013. The westbound approach from Oakland to the Skyway was completed by the Oakland Touchdown #1 contract in 2009.



#### STEP 6 - EASTBOUND OPENING

Opening of the bridge in the eastbound direction is pending completion of Oakland Touchdown #2. Westbound traffic will need to be routed off the existing bridge before the eastbound approach structure can be completed.

**Status:** The eastbound opening is forecast for December 2013. The eastbound temporary detour road will be completed in June 2010 by the OTD#1 contractor.





## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### ***Self-Anchored Suspension (SAS) Superstructure Fabrication Activities***

#### ***Roadway and Tower Segments***

Like giant three-dimensional jigsaw puzzles, the roadway and tower boxes of the SAS bridge are hollow steel shells that are internally strengthened and stiffened by a highly engineered network of welded steel ribs and diaphragms. The use of steel in this manner allows for a flexible yet relatively light and strong structure able to withstand the massive loads placed on the bridge during seismic events.

On the critical path to completing the bridge are the fabrication of the last four roadway boxes (segments 13 and 14 east and west). Start of fabrication of these boxes has fallen behind schedule due to delays in the fabrication drawing preparation process. These delays will likely preclude the westbound opening of the bridge in 2012, but we continue to push for the opening of the bridge to traffic in both directions in 2013.

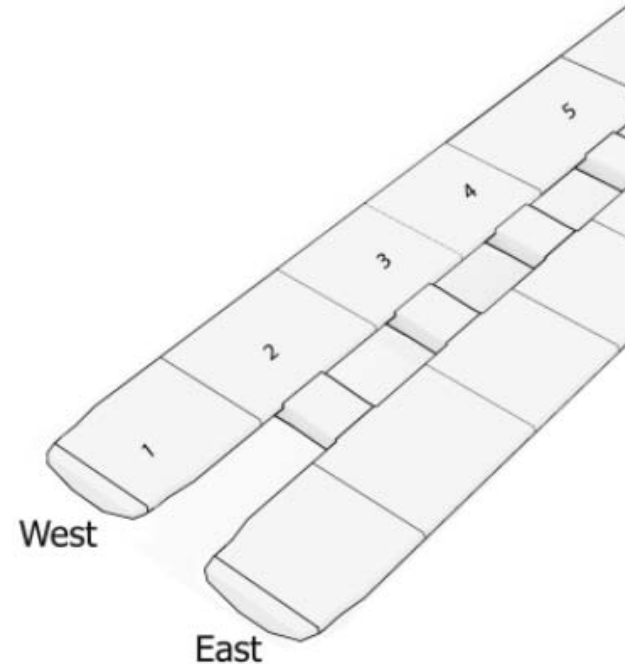
All components undergo a rigorous quality review by ZPMC, ABF, and Caltrans to ensure that only bridge components that have been built in accordance to contract specifications will be shipped.

**Roadway Box Fabrication Status:** As shown in the diagram to the right, roadway boxes 1 through 6 east and west have been completed and shipped to the Bay Area. Boxes 7 through 9 east and west are in trial assembly or painting. The remaining boxes are still being pieced together into larger segments.

**Tower Fabrication Status:** Each of the four legs of the towers is composed of five separate lifts. The lifts get progressively shorter and lighter as they progress up the tower. Currently, the first four lifts of tower boxes are in various stages of fabrications with lifts 1 and 2 most furthest along. Tower boxes 1 and 2 have been trial fit together to ensure alignment.

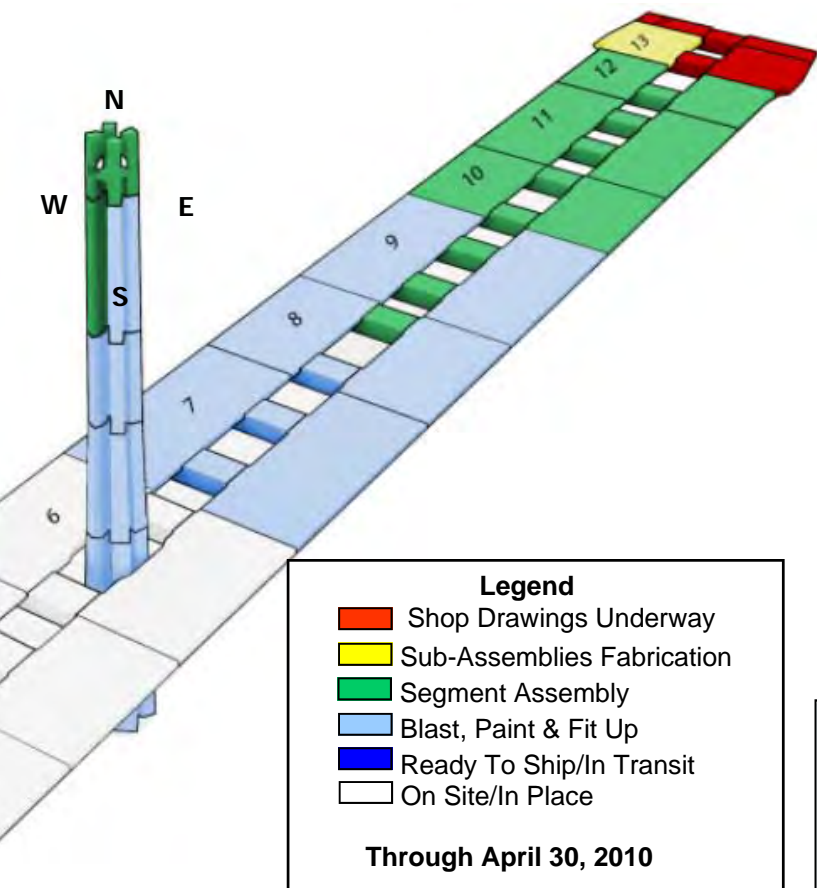


SAS Trial Assembly Yard Roadway Boxes 7 and 8



# Fabrication Progress Diagram

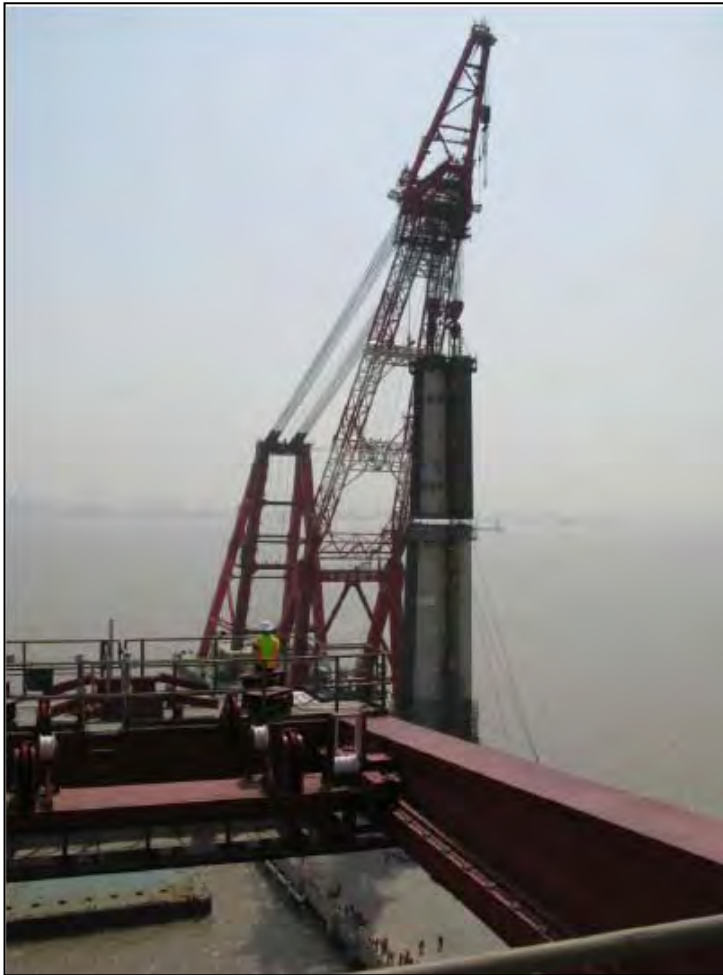
Through April 2010



SAS Tower Crossbeam Installation



SAS Welding Roadway Box



SAS Lifting of Tower Box #2



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### ***Self-Anchored Suspension (SAS) Superstructure Fabrication Activities (cont.)***

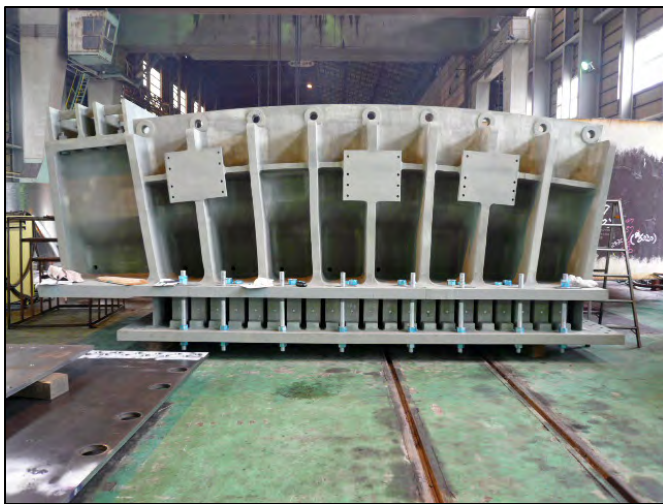
#### ***Cables and Suspenders***

One continuous main cable will be used to support the roadway deck of the SAS bridge. Anchored into the eastern end of the bridge, the main cable will be anchored with the roadway box at the east end of the SAS near Pier E1, go over the main tower at T1, loop around the western end of the roadway decks at Pier W2, and then go back over the main tower to the western end of the box girder. The main cable will be made up of bundles of individual wire strands. Supporting the roadway decks to the main cable will be a number of smaller suspender cables. The main cable will be fabricated in China and the suspender cables in Missouri, USA.

**Status:** The first half of the cable shipment arrived on site in January 2010 and the second half is expected in the summer of 2010.



**SAS 75mm Suspender Sockets after Machining**



**SAS East Saddle Assembled with Rockers**

#### ***Saddles, Bearings, Hinges, and Other Bridge Components***

The mounts on which the main cable and suspender ropes will sit are made from solid steel castings. Castings for the main cable saddles are being made by Japan Steel Works, while the cable bands and brackets are being made by Goodwin Steel in the United Kingdom.

The bridge bearings and hinges that support, connect, and transfer loads from the self-anchored suspension (SAS) span to the adjoining sections of the new east span are being fabricated in a number of locations. Work on the bearings is being performed in Pennsylvania, USA and Hochang, South Korea, while hinge pipe beams are being fabricated in Oregon, USA.

**Status:** The cable saddles and hinges at the W2 cap beam and YBITS are under fabrication. The west deviation saddles arrived at Pier 7 on April 15, 2010.

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### ***Self-Anchored Suspension (SAS) Superstructure Field Activities***



Shear-Leg Barge Crane

#### ***Temporary Support Structures***

To erect the roadway decks and tower of the bridge, temporary support structures will first be put in place. Almost a bridge in itself, the temporary support structures will stretch from the end of the completed Skyway back to Yerba Buena Island. For the tower, a strand jack system is being built into the tower's temporary frame to elevate the upper sections of the tower into place. These temporary supports are being fabricated in the Bay Area, as well as in Oregon and in China at ZPMC.

**Status:** The temporary support structures are substantially complete. A mid section of the westbound truss has been left out for installation of tower lift 1.

#### ***Cap Beams***

Construction of the massive steel-reinforced concrete cap beams that link the columns at piers W2 and E2 was left to the SAS superstructure contractor and represents the only concrete portions of work on that contract. The east and west ends of the SAS roadway will rest on the cap beams and the main cable will wrap around Pier W2, while anchoring into the east end of the SAS deck sections near E2.

**Status:** Completed March 2009

#### ***Shear-Leg Barge Crane***

The massive shear-leg barge crane that is helping to build the SAS superstructure arrived in the San Francisco Bay on March 12, 2009 after a trans-Pacific voyage.

The crane and barge are separate units operating as a single entity named the "Left Coast Lifter." The 400-by-100-foot barge is a U.S. flagged vessel that was custom built in Portland, Oregon by U.S. Barge, LLC and outfitted with the crane by Shanghai Zhenhua Heavy Industry Co. Ltd. (ZPMC) at a facility near Shanghai, China. The crane's boom weighs 992 tons and is 328 feet long. The crane can lift up to 1,873 tons, including the deck and tower boxes for the SAS.

**Status:** The shear-leg barge crane arrived at the jobsite March 2009. The crane has off-loaded and placed all temporary support structures and SAS roadway boxes and crossbeams.



SAS W2 Cap Beam



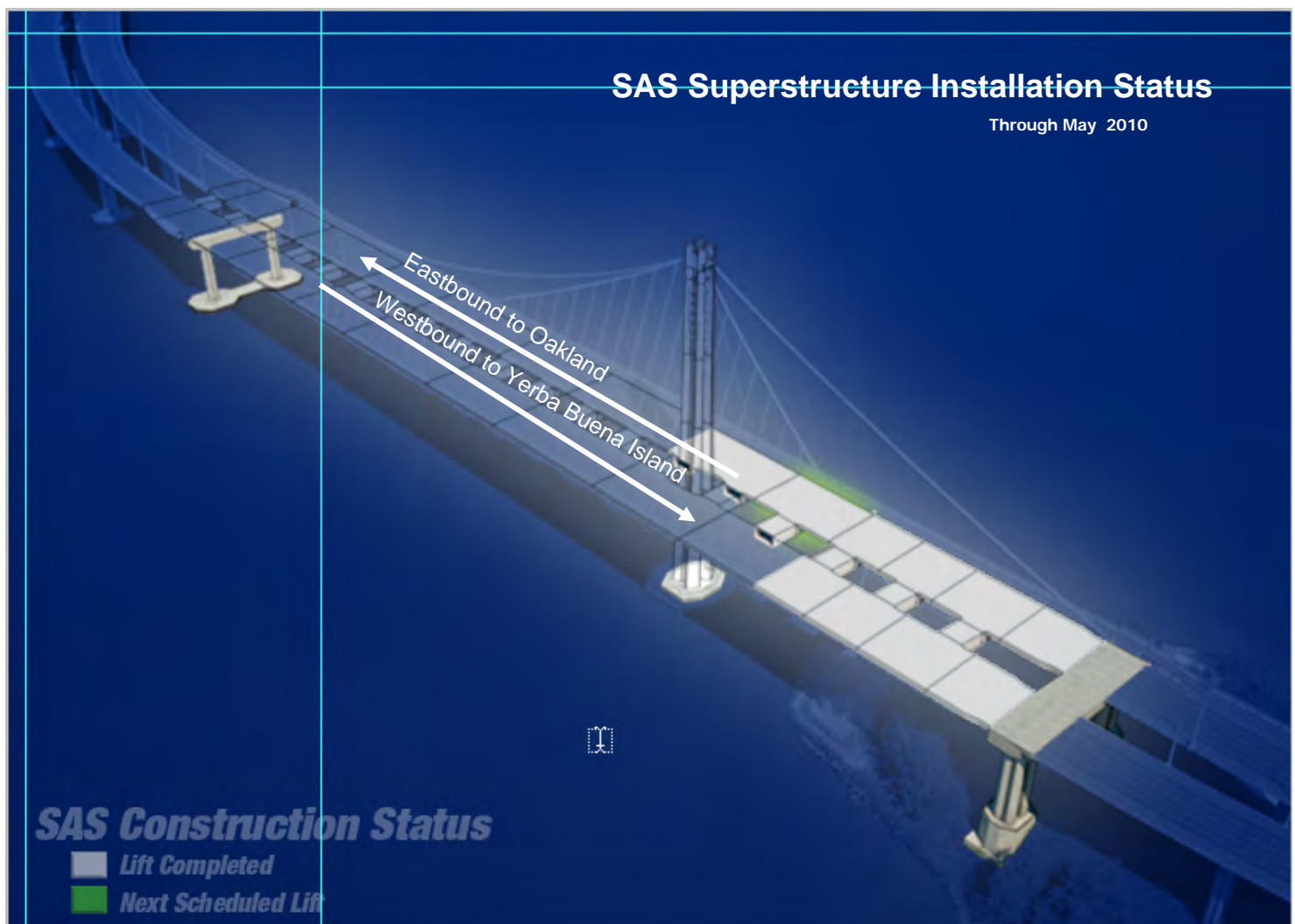
## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### ***Self-Anchored Suspension (SAS) Superstructure Installation Activities***

Upon arrival in Oakland, the steel roadway and tower sections are off-loaded directly from the transport ship onto barges to await installation atop the temporary support structures. The steel roadway sections will be installed from west to east. Due to the shallow waters near Yerba Buena Island, the eastbound lanes on the south side of the new bridge will be installed first, then to be followed by the westbound lanes. In total, there are 28 roadway sections (14 in each direction) that range from 560 to 1660 tons and from 80 to 230 feet long.

The tower comprises 4 legs, each made up of four tower box lifts that make up the majority of the height of the tower. To the tower boxes are added the tower grillage, and finally the tower head.

**Status:** The first four east and four west roadway boxes arrived in the Bay Area in late January 2010. All have been lifted into place and are now being welded together to form a continuous roadway. Four additional boxes arrived on April 18, 2010, of which two have been placed on the eastbound temporary support structure and two have been off-loaded onto barges to await installation atop the temporary support structure (see additional diagram on page 24 and 25).





SAS Roadway Box Girder Closure Pour



SAS Crossbeam #5 Being Lifted into Place



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Skyway

The Skyway, which comprises much of the new East Span, will drastically change the appearance of the Bay Bridge. Replacing the gray steel that currently cages drivers, a graceful, elevated roadway supported by piers will provide sweeping views of the bay.

#### **E Skyway Contract**

**Contractor:** Kiewit/FCI/Manson, Joint Venture

**Approved Capital Outlay Budget:** \$1.25 B

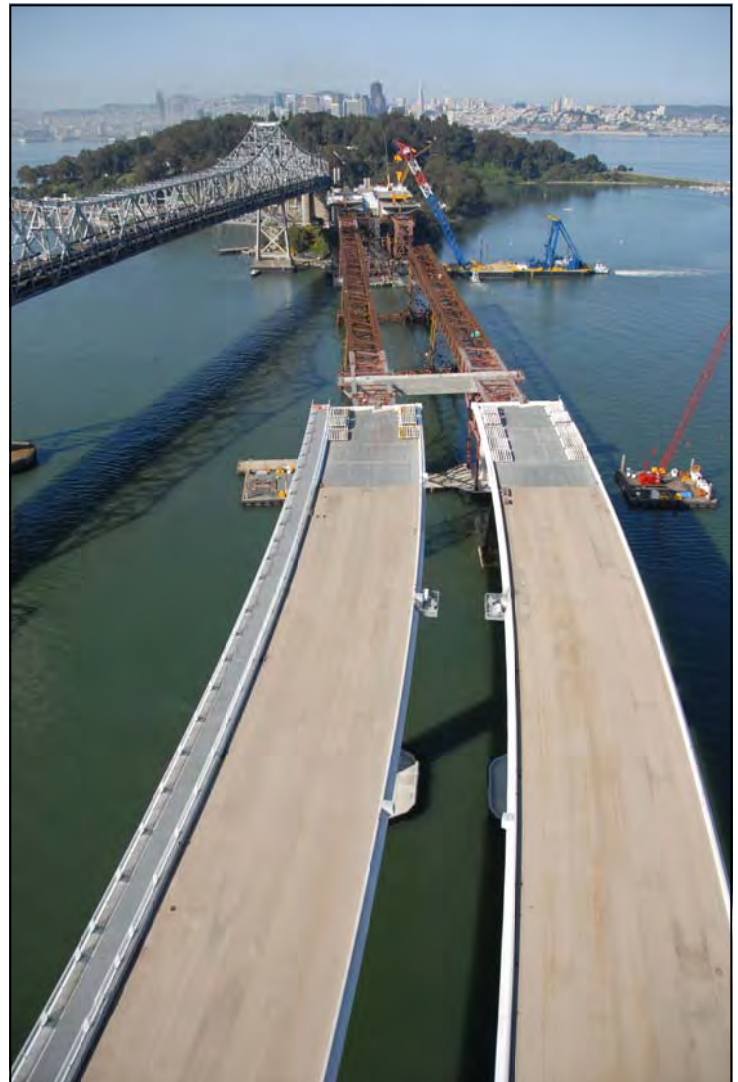
**Status:** Completed April 2008

Extending for more than a mile across Oakland mudflats, the Skyway is the longest section of the East Span. It sits between the new Self-Anchored Suspension (SAS) span and the Oakland Touchdown. In addition to incorporating the latest seismic-safety technology, the side-by-side roadway decks of the Skyway feature shoulders and lane widths built to modern standards.

The Skyway's decks are composed of 452 pre-cast concrete segments (standing three stories high), containing approximately 200 million pounds of structural steel, 120 million pounds of reinforcing steel, 200 thousand linear feet of piling and about 450 thousand cubic yards of concrete. These are the largest segments of their kind ever cast and were lifted into place by custom-made winches.

The Skyway marine foundation consists of 160 hollow steel pipe piles measuring eight feet in diameter and dispersed among 14 sets of piers. The 365-ton piles were driven more than 300 feet into the deep bay mud. The new East Span piles were battered or driven in at an angle, rather than vertically, to obtain maximum strength and resistance.

Designed specifically to move during a major earthquake, the Skyway features several state-of-the-art seismic safety innovations, including 60-foot-long hinge pipe beams. These beams will allow deck segments on the Skyway to move, enabling the deck to withstand greater motion and to absorb more earthquake energy.



Overview of the Skyway and the Temporary Support Structures with the Shear-Leg Barge Crane Lifting Roadway Boxes or Orthotropic Box Girders (OBG) into Place

## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Oakland Touchdown

When completed, the Oakland Touchdown (OTD) structures will connect Interstate 80 in Oakland to the new side-by-side decks of the new East Span. For westbound drivers, the OTD will be their introduction to the graceful new East Span. For eastbound drivers from San Francisco, this section of the bridge will carry them from the Skyway to the East Bay, offering unobstructed views of the Oakland hills.

The OTD will be constructed through two contracts. The first contract will build the new westbound lanes, as well as part of the eastbound lanes. The second contract to complete the eastbound lanes cannot fully begin until westbound traffic is shifted onto the new bridge. This enables a portion of the upper deck of the existing bridge to be demolished allowing for a smooth transition for the new eastbound lanes in Oakland.

#### **F** Oakland Touchdown #1 Contract

Contractor: MCM Construction, Inc.

Current Capital Outlay Budget: \$212.0 M

Status: 97% Complete as of April 2010

The OTD #1 contract constructs the entire 1,000-foot-long westbound approach from the toll plaza to the Skyway. When completed, the westbound approach structure will provide direct access to the westbound Skyway. In the eastbound direction, the contract will construct a portion of the eastbound structure and all of the eastbound foundations that are not in conflict with the existing bridge.

**Status:** On the OTD #1 westbound structure, the contractor has completed all work and is forecasting to complete all eastbound structure work in June 2010. The contractor, MCM, has removed the trestles.

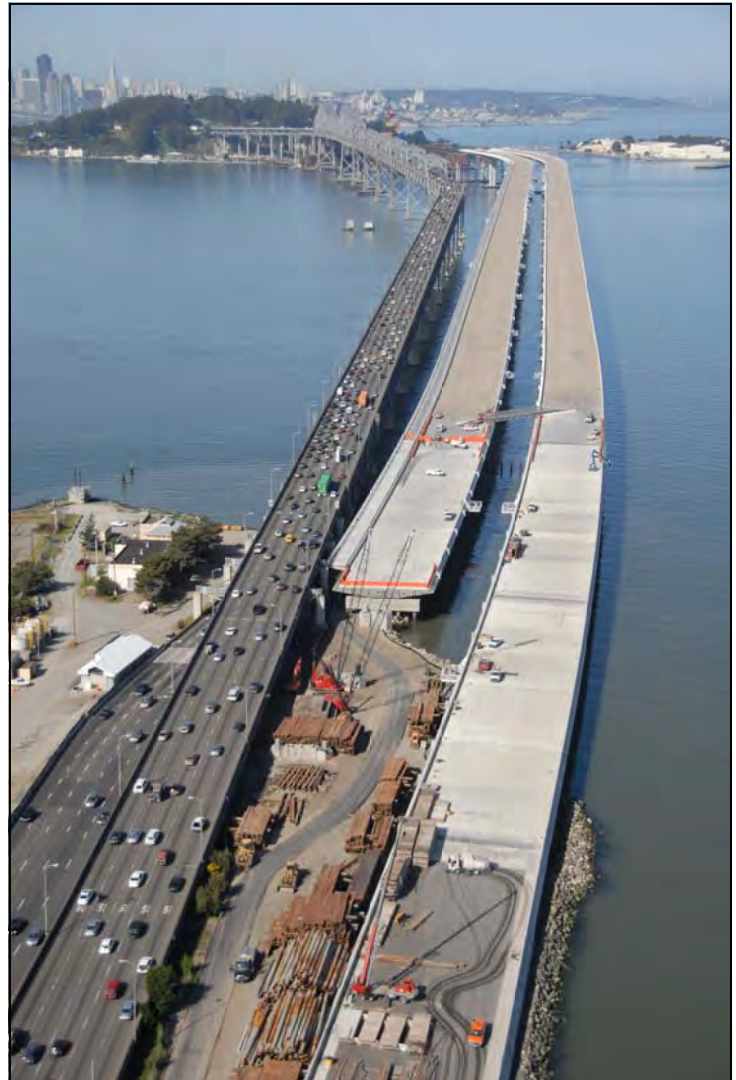
#### **G** Oakland Touchdown #2 Contract

Contractor: TBD

Current Capital Outlay Budget: \$62.0 M

Status: In design

The OTD #2 contract will complete the eastbound approach structure from the end of the Skyway to Oakland. This work is critical to the eastbound opening of the new bridge, but cannot be completed until westbound traffic has been shifted off the existing upper deck to the new SAS Bridge.



Overview of Oakland Touchdown #1 Project Status



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### San Francisco-Oakland Bay Bridge East Span Replacement Project Other Contracts

A number of contracts needed to relocate utilities, clear areas of archeological artifacts, and prepare areas for future work have already been completed. The last major contract will be the eventual demolition and removal of the existing bridge, which by that time will have served the Bay Area for nearly 80 years. Following is a status of some the other East Span contracts.



Archeological Investigations

### East Span Interim Seismic Retrofit

Contractors: 1) California Engineering Contractors  
2) Balfour Beatty

Approved Capital Outlay Budget: \$30.8 M

Status: Completed October 2000

After the 1989 Loma Prieta Earthquake, and before the final retrofit strategy was determined for the East Span, Caltrans completed an interim retrofit of the existing bridge to prevent a catastrophic collapse of the bridge should a similar earthquake occur before the East Span was completely replaced. The interim retrofit was performed under two separate contracts that lengthened pier seats, added some structural members, and strengthened areas of the bridge so they would be more resilient during an earthquake.



Existing East Span of Bay Bridge

### Stormwater Treatment Measures

Contractor: Diablo Construction, Inc.

Approved Capital Outlay Budget: \$18.3 M

Status: Completed December 2008

The Stormwater Treatment Measures contract implemented a number of best practices for the management and treatment of stormwater runoff. Focusing on the areas around and approaching the toll plaza, the contract added new drainage and built new bio-retention swales and other related constructs.



Stormwater Retention Basin

## Yerba Buena Island Substation

Contractor: West Bay Builders

Approved Capital Outlay Budget: \$11.6 M

Status: Completed May 2005

This contract relocated an electrical substation just east of the Yerba Buena Island Tunnel in preparation for the new East Span.

## Pile Installation Demonstration

Contractor: Manson and Dutra, Joint Venture

Approved Capital Outlay Budget: \$9.2 M

Status: Completed December 2000

While large-diameter battered piles are common in offshore drilling, the new East Span is one of the first bridges to use large-diameter battered piles in its foundations. To minimize project risks and build industry knowledge, a pile installation demonstration project was initiated to prove the efficacy of the proposed technology and methodology. The demonstration was highly successful and helped result in zero contract change orders or claims for pile driving on the project.

## H Existing Bridge Demolition

Contractor: TBD

Approved Capital Outlay Budget: \$239.1 M

Status: In Design

Design work on the contract will start in earnest as the opening of the new bridge to traffic approaches.



New YBI Electrical Substation

## I Electrical Cable Relocation

Contractor: Manson Construction

Approved Capital Outlay Budget: \$9.6 M

Status: Completed January 2008

A submerged cable from Oakland that is close to where the new bridge will touch down supplies electrical power to Treasure Island. To avoid any possible damage to the cable during construction, two new replacement cables were run from Oakland to Treasure Island. The extra cable was funded by the Treasure Island Development Authority and its future development plans.



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### Antioch Bridge Seismic Retrofit Project

Contractor: California Engineering Contractors, Inc.

Approved Capital Outlay Budget: \$156.0 M

Status: **Awarded**

Serving the Delta region of the Bay Area, the Antioch Bridge takes State Route 160 traffic over the San Joaquin River, linking eastern Contra Costa County with Sacramento County. The current 1.8 mile-long steel plate girder bridge was opened in 1978 with one lane in each direction. The current retrofit strategy for the bridge includes relatively minor modifications to the approach structure on Sherman Island, the addition of isolation bearings and strengthening of the columns and hinge retrofits.

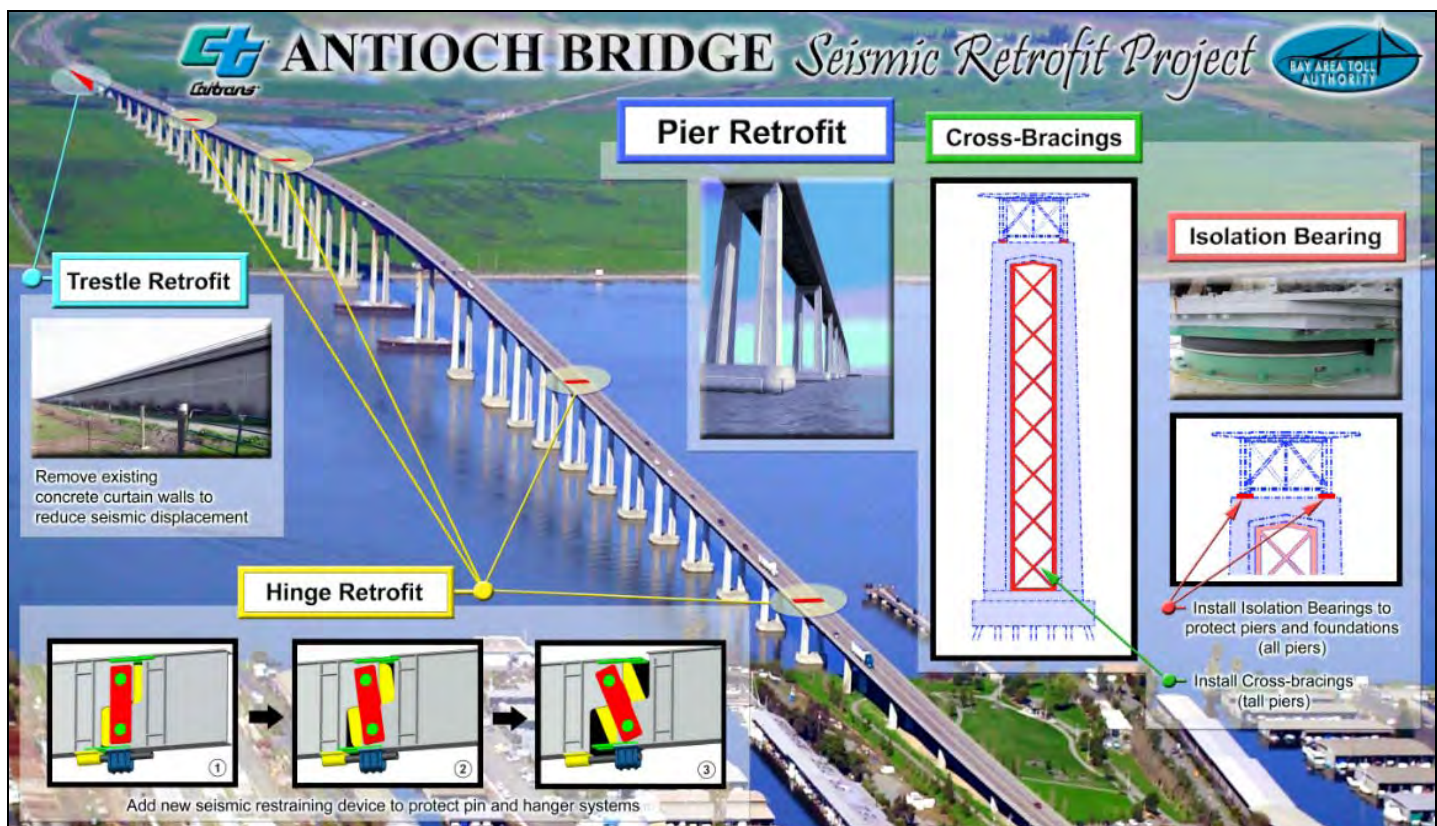
**Status:** Bids for the retrofit contract were opened on March 10, 2010. The contract was awarded to California Engineering Contractors, Inc. on April 22, 2010. The awarded contract was significantly less than the engineer's estimate for the work and has resulted in a significant cost forecast reduction. The TBPOC is recommending that the



Antioch Bridge

budget for the project be reduced to account for the low bid. The original budget for the project was \$267 million.

With the low bid, the TBPOC is forecasting a need of only \$130 million. The retrofit is forecast to be completed by May 2012.



Seismic Retrofit Strategy Summary for Antioch Bridge

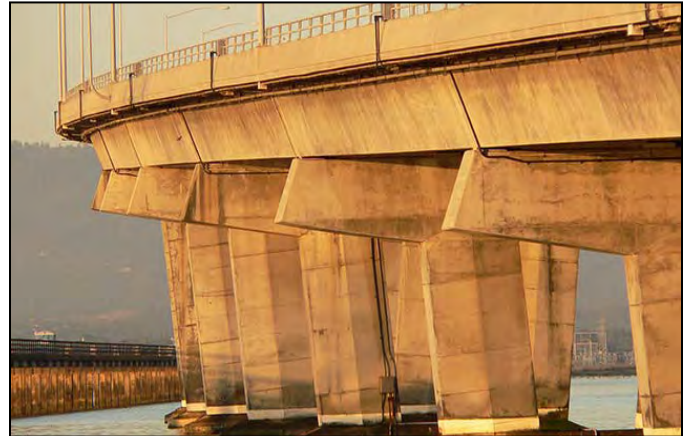
## Dumbarton Bridge Seismic Retrofit Project

Contractor: TBD.

Approved Capital Outlay Budget: \$270.0 M

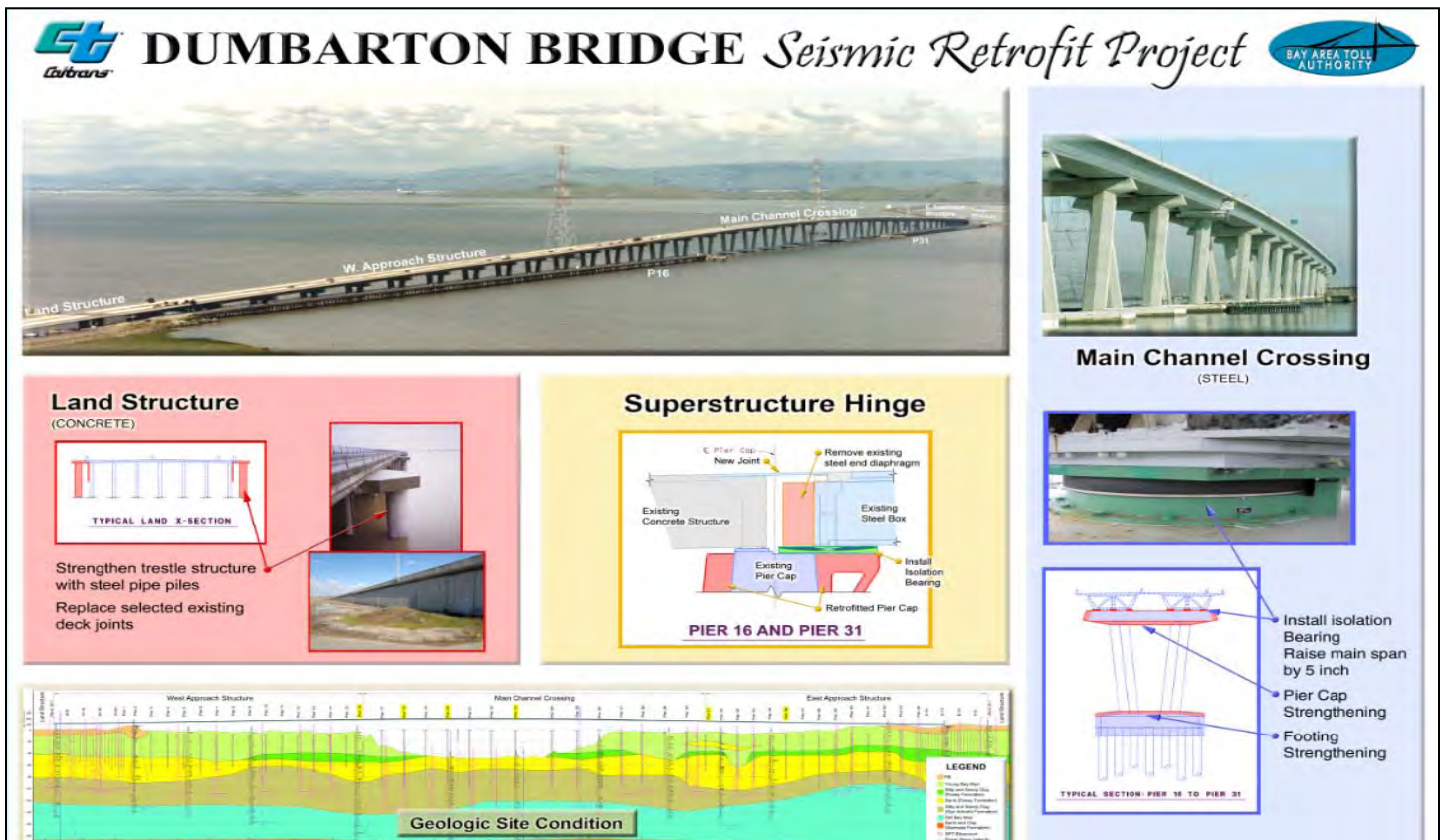
Status: Advertised

The current Dumbarton Bridge was opened to traffic in 1982 linking the cities of Newark in Alameda County and East Palo Alto in San Mateo County. The 1.6 mile long bridge has six lanes (three in each direction) and an eight-foot bicycle/pedestrian pathway. The bridge is a combination of reinforced concrete and steel girders that support a reinforced lightweight concrete roadway on reinforced concrete columns. The current retrofit strategy for the bridge includes superstructure and deck modifications and installation of isolation bearings.



Dumbarton Bridge

**Status:** The retrofit contract was advertised in March 2010 with bid opening scheduled for mid June.



Seismic Retrofit Strategy Summary for Dumbarton Bridge



## TOLL BRIDGE SEISMIC RETROFIT PROGRAM

### Other Completed Projects

In the 1990s, the State Legislature identified seven of the nine state-owned toll bridges for seismic retrofit. In addition to the San Francisco-Oakland Bay Bridge, these included the Benicia-Martinez, Carquinez, Richmond-San Rafael and San Mateo-Hayward bridges in the Bay Area, and the Vincent Thomas and Coronado bridges in Southern California. Other than the East Span of the Bay Bridge, and the recent inclusion of the Dumbarton and Antioch bridges, the retrofits of all of the bridges have been completed.

### San Mateo-Hayward Bridge Seismic Retrofit Project

**Project Status: Completed 2000**

The San Mateo-Hayward Bridge seismic retrofit project focused on strengthening the high-rise portion of the span. The foundations of the bridge were significantly upgraded with additional piles.



High-Rise Section of San Mateo-Hayward Bridge

### 1958 Carquinez Bridge Seismic Retrofit Project

**Project Status: Completed 2002**

The eastbound 1958 Carquinez Bridge was retrofitted in 2002 with additional reinforcement of the cantilever thru-truss structure.

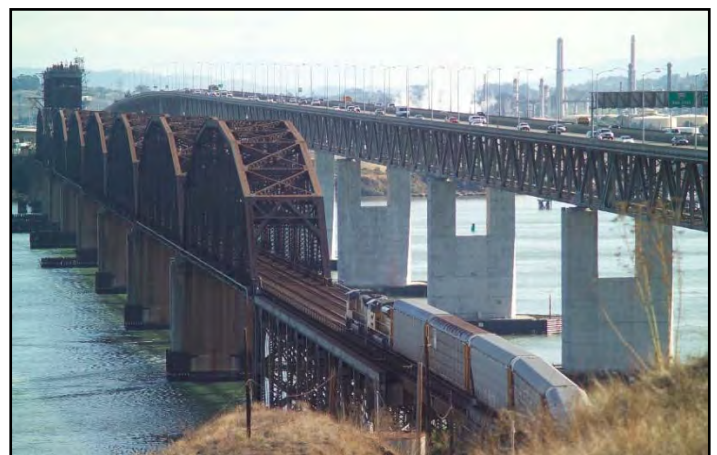


1958 Carquinez Bridge (foreground) with the 1927 Span (middle) under Demolition and the New Alfred Zampa Memorial Bridge (background)

### 1962 Benicia-Martinez Bridge Seismic Retrofit Project

**Project Status: Completed 2003**

The southbound 1962 Benicia-Martinez Bridge was retrofitted to "Lifeline" status with the strengthening of the foundations and columns and the addition of seismic bearings that allow the bridge to move during a major seismic event. The Lifeline status means the bridge is designed to sustain minor to moderate damage after an event and to reopen quickly to emergency response traffic.



1962 Benicia-Martinez Bridge (right)

## Richmond-San Rafael Bridge Seismic Retrofit Project

**Project Status: Completed 2005**

The Richmond-San Rafael Bridge was retrofitted to a “No Collapse” classification to avoid catastrophic failure during a major seismic event. The foundations, columns, and truss of the bridge were strengthened, and the entire low-rise approach viaduct from Marin County was replaced.

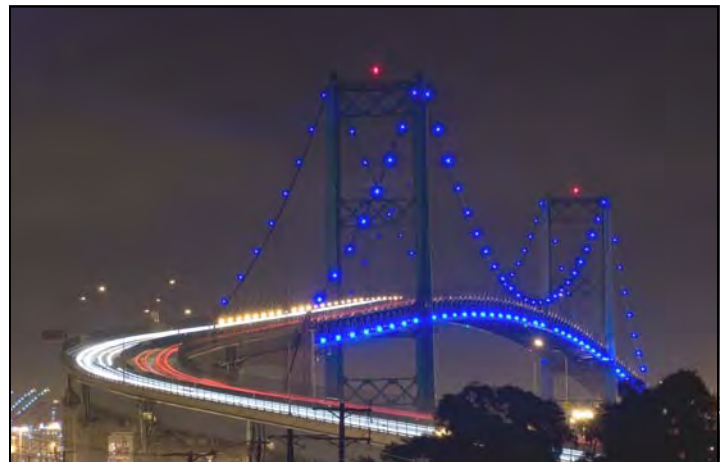


Richmond-San Rafael Bridge

## Los Angeles-Vincent Thomas Bridge Seismic Retrofit Project

**Project Status: Completed 2000**

The Vincent Thomas Bridge is a 1,500-foot long suspension bridge crossing the Los Angeles Harbor in Los Angeles that links San Pedro with Terminal Island. The bridge was one of two state-owned toll bridges in Southern California (the other being the San Diego-Coronado Bridge). Opened in 1963, the bridge was seismically retrofitted as part of the TBSRP in 2000.



Los Angeles-Vincent Thomas Bridge

## San Diego-Coronado Bridge Seismic Retrofit Project

**Project Status: Completed 2002**

The San Diego-Coronado Bridge crosses over San Diego Bay and links the cities of San Diego and Coronado. Opened in 1969, the 2.1 mile long bridge was seismically retrofitted as part of the Toll Bridge Seismic Retrofit Project in 2002.

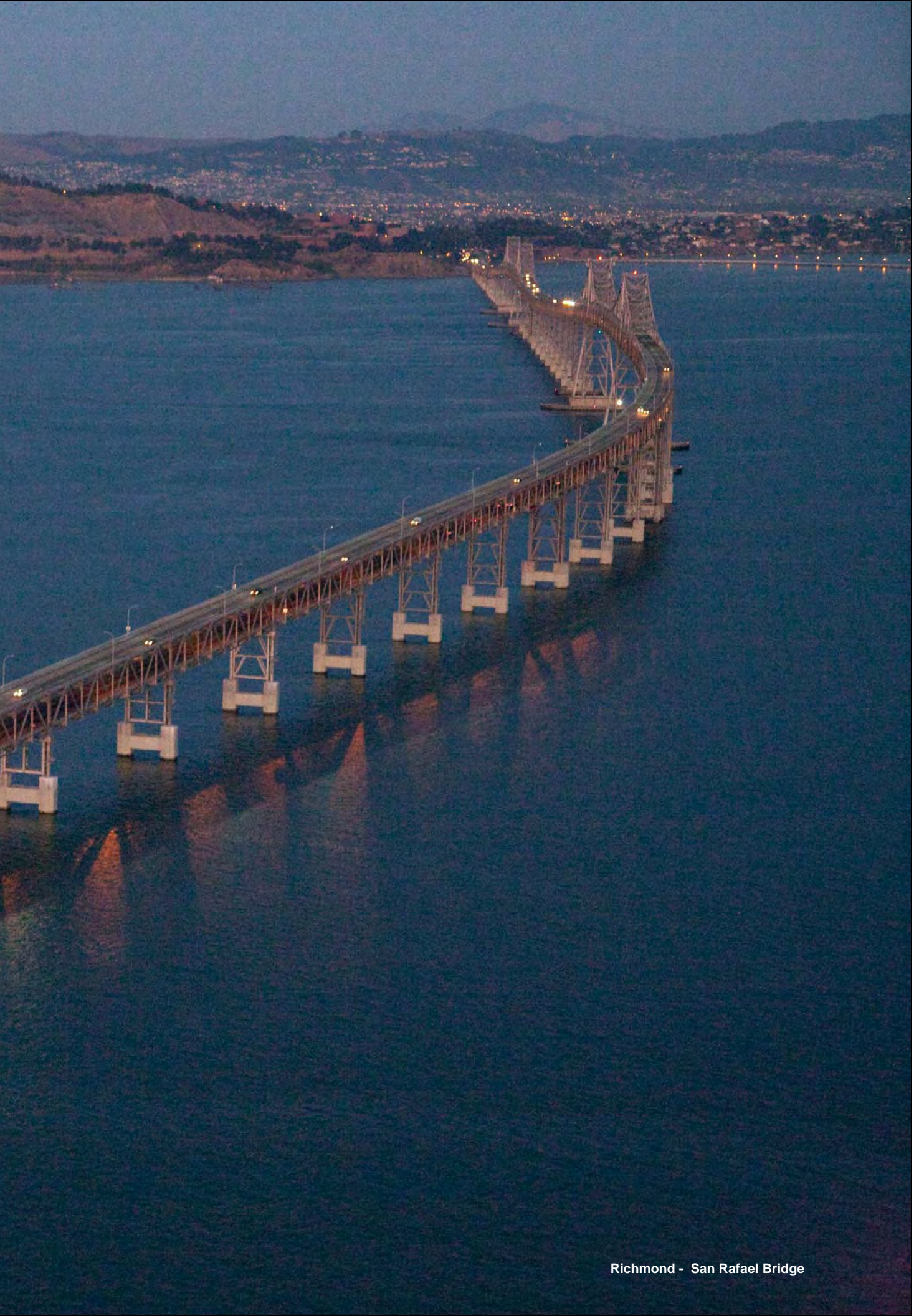


San Diego-Coronado Bridge









Richmond - San Rafael Bridge

# REGIONAL MEASURE 1 TOLL BRIDGE PROGRAM

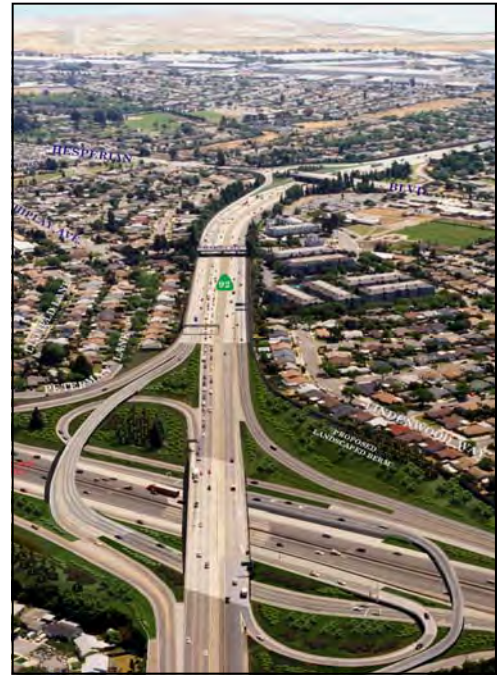


## REGIONAL MEASURE 1 PROGRAM

### Interstate 880/State Route 92 Interchange Reconstruction Project

The Interstate 880/State Route 92 Interchange Reconstruction Project is the final project under the Regional Measure 1 Toll Bridge Program. Project completion fulfills a promise made to Bay Area voters in 1988 to deliver a slate of projects that would help expand bridge capacity, reduce congestion and improve safety on the bridges.

This corridor is consistently one of the Bay Area's most congested during the evening commute. This is due in part to the lane merging and weaving that is required by the existing cloverleaf interchange. The new interchange will feature direct freeway-to-freeway connector ramps that will increase traffic capacity and improve overall safety and traffic operations in the area. With the new direct-connector ramps, drivers coming off the San Mateo-Hayward Bridge can access Interstate 880 without having to compete with traffic headed onto east Route 92 from south Interstate 880 (see additional progress photos on pages 74 and 75).



Future Interstate 880/State Route 92 Interchange (as simulated) ,Looking West toward San Mateo.

### Interstate 880/State Route 92 Interchange Reconstruction Contract

Contractor: Flatiron/Granite

Approved Capital Outlay Budget: \$161.0 M

Status: 69% Complete As Of April 2010



Overview of Progress to Date



### **Stage 1 – Construct East Route 92 to North Interstate 880 Connector**

The new east Route 92 to north Interstate 880 connector (ENCONN) is the most critical flyover structure for relieving congestion in the corridor. The ENCONN will be first used as a detour to allow for future stages of work, while keeping traffic flowing.

**Status:** ENCONN was completed and opened to detour traffic on May 16, 2009.

### **Stage 2 – Replace South Side of Route 92 Separation Structure**

By detouring eastbound Route 92 traffic onto ENCONN, the existing separation structure that carries SR92 over I-880 can be replaced. The existing structure will be cut lengthwise, and then demolished and replaced separately. In this stage, the south side of the structure will be replaced, while west Route 92 and south-Interstate-880-to- east-Route-92 traffic will stay on the remaining structure.

**Status:** Work on the south side of the separation structure is complete. Detour traffic switches onto the new separation structure will be completed in late April 2010.

### **Stage 3 – Replace North Side of Route 92 Separation Structure**

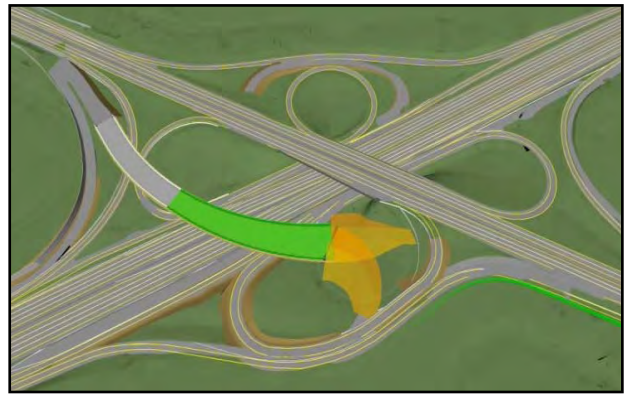
Upon completion of Stage 2, the existing north side of the separation structure will be demolished and replaced. Its traffic will then be shifted onto the newly reconstructed south side.

**Status:** The demolition of the existing westbound separation structure (north side) will begin April 26, 2010.

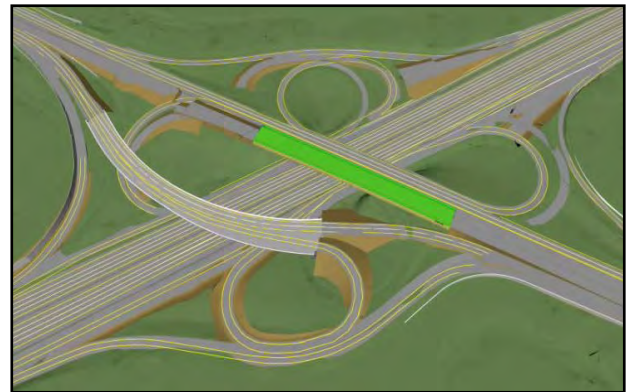
### **Stage 4 – Final Realignment and Other Work**

Upon completion of the Route 92 separation structure, east Route 92 traffic can be shifted onto its permanent alignment from the new ENCONN and directly under the new separation structure. Along with the ENCONN and Route 92 separation structures, several soundwalls, a pedestrian overcrossing on I-880 at Eldridge Avenue and other ramps and structures will also be reconstructed as part of this project. Work will begin at the North to West Connector Bridge (NWCONN). As part of this construction sequence the MSE Wall D1 / D2 is key to completion of this work. This traffic movement will allow for reducing congestion moving on I-880 North to SR-92 Westbound. The final structure to be completed moves traffic from eastbound SR92 to southbound I-880. This structure is the West to South Connector Bridge (WCONN).

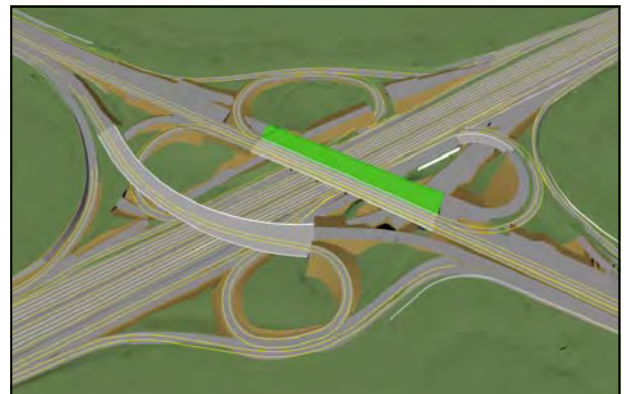
**Status:** Work continues on retaining wall A in the northwest quadrant, (Stage 2) as well as on the Eldridge Avenue pedestrian overcrossing. The POC is currently 63% complete. The new pump station construction is ongoing and scheduled to be completed in August 2010. The Eastbound SR-92 separation structure commenced construction in April 2010. The demolition of the existing structure is complete and the start of construction for the new separation structure has started. The Calaroga Bridge temporary bridge was completed January 15, 2010. The Calaroga left bridge is approximately 30 percent complete and is forecast to complete in August 2010. Upon completion of the left bridge the right bridge will be constructed and is forecast to be complete the first quarter of 2011. NWCONN is currently forecast to complete in the second quarter of 2011.



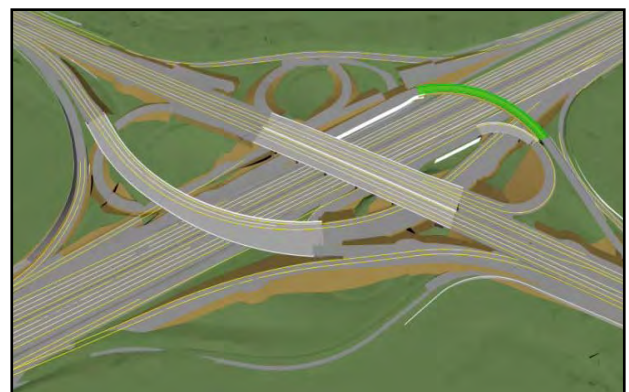
**Stage 1 - Construct East Route 92 to North Interstate 880 Direct Connector**



**Stage 2 - Demolish and Replace South Side of Route 92 Separation Structure**



**Stage 3 - Demolish and Replace North Side of Route 92 Separation Structure**



**Stage 4 - Final Realignment and Other Work**



## REGIONAL MEASURE 1 PROGRAM

### Other Completed Projects

#### San Mateo-Hayward Bridge-Widening Project

**Project Status: Completed 2003**

This project expanded the low-rise concrete trestle section of the San Mateo-Hayward Bridge to allow for three lanes in each direction to match the existing configuration of the high-rise steel section of the bridge.



Widening of the San Mateo-Hayward Bridge Trestle on Left

#### Richmond-San Rafael Bridge Rehabilitation Projects

**Project Status: Completed 2006**

Two major rehabilitation projects for the Richmond-San Rafael Bridge were funded and completed:

- (1) replacement of the western concrete approach trestle and ship-collision protection fender system; and
- (2) rehabilitation of deck joints and resurfacing of the bridge deck.

In 2005, along with the seismic retrofit of the bridge, the trestle and fender replacement work was completed as part of the same project. Under a separate contract in 2006, the bridge was resurfaced with a polyester concrete overlay along with the repair of numerous deck joints.



New Richmond-San Rafael Bridge West Approach Trestle under Construction

#### Richmond Parkway Construction Project

**Project Status: Completed 2001**

The final connections to the Richmond Parkway from Interstate 580 near the Richmond-San Rafael Bridge were completed in May 2001.

## **New Alfred Zampa Memorial (Carquinez) Bridge Project**

**Project Status: Completed 2003**

The new western span of the Carquinez Bridge, which replaced the original 1927 span, is a twin-towered suspension bridge with three mixed-flow lanes, a new carpool lane shoulders and a bicycle and pedestrian pathway.



**New Alfred Zampa Memorial (Carquinez) Bridge Soon after Opening to Traffic, with Crockett Interchange Still under Construction**

## **Benicia-Martinez Bridge Project**

**Project Status: Completed 2009**

A two-year project to rehabilitate and reconfigure the original Benicia-Martinez Bridge began shortly after the opening of the new Congressman George Miller Bridge. The existing 1.2-mile roadway surface on the steel deck truss bridge was modified to carry four lanes of southbound traffic (one more than before)—with shoulders on both sides—plus a bicycle/pedestrian path on the west side of the span that connects to Park Road in Benicia and to Marina Vista Boulevard in Martinez. Reconstruction of the east side of the bridge and approaches was completed in August 2008 and reconstruction of the west side of the bridge an approaches and construction of the bicycle/pedestrian pathway was completed in August 2009.



**Benicia-Martinez Bridge Pedestrian/Bicycle Pathway Opened to The Public in August 2009**

## **Bayfront Expressway (State Route 84) Widening Project**

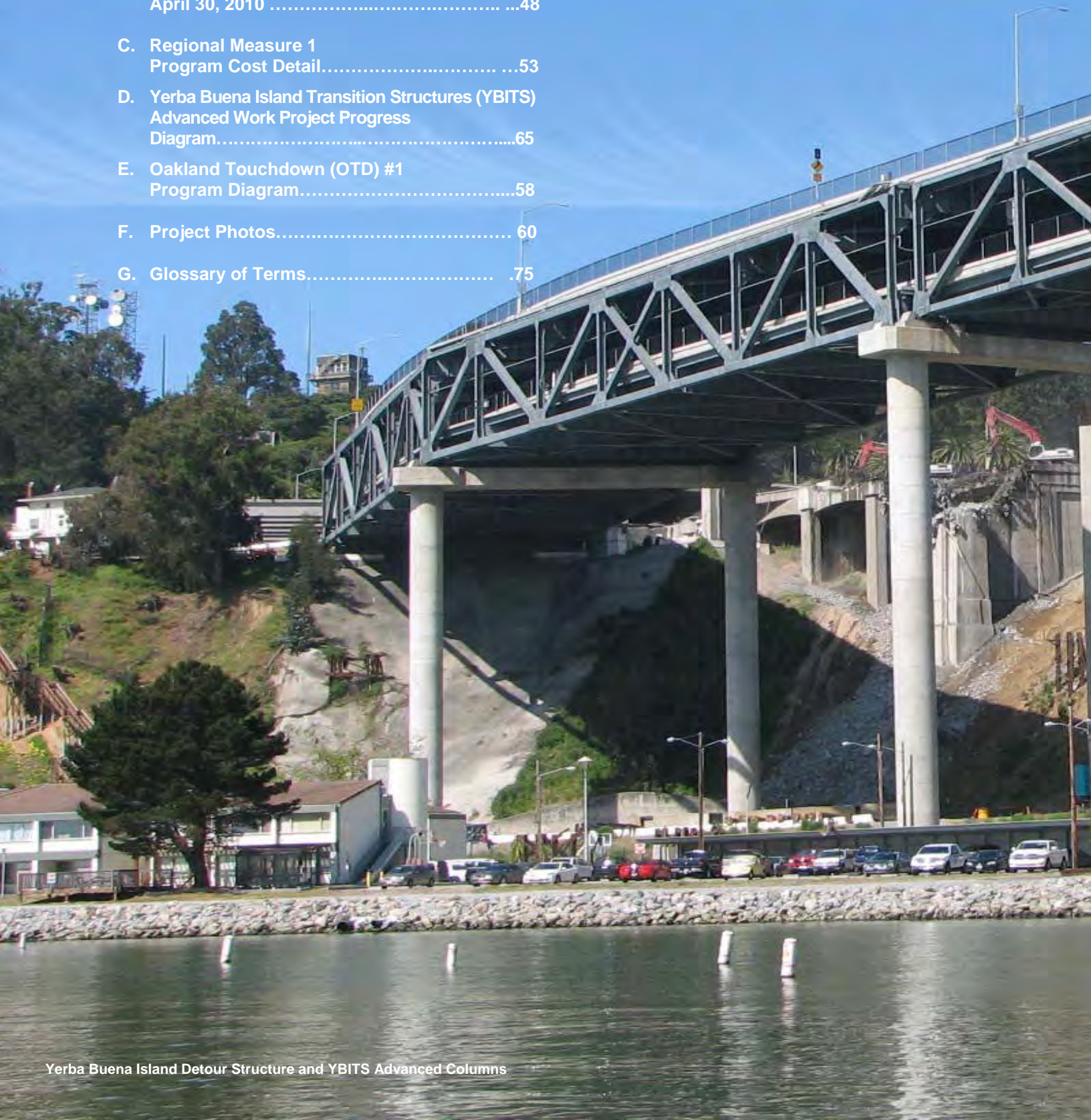
**Project Status: Completed 2004**

This project expanded and improved the roadway from the Dumbarton Bridge touchdown to the US 101/Marsh Road interchange by adding additional lanes and turn pockets and improving bicycle and pedestrian access in the area.



## APPENDICES

A. TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 (A-1 and A-2).....	46
B. TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 .....	48
C. Regional Measure 1 Program Cost Detail.....	53
D. Yerba Buena Island Transition Structures (YBITS) Advanced Work Project Progress Diagram.....	65
E. Oakland Touchdown (OTD) #1 Program Diagram.....	58
F. Project Photos.....	60
G. Glossary of Terms.....	75









## Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 (\$ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (04/2010)	Cost To Date (04/2010)	Cost Forecast (04/2010)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>SFOBB East Span Replacement Project</b>						
Capital Outlay Support	959.3	-	959.3	835.7	1,262.2	302.9
Capital Outlay Construction	4,492.2	203.8	4,696.0	3,335.2	4,929.3	233.3
Other Budgeted Capital	35.1	(3.3)	31.8	0.7	7.7	(24.1)
<b>Total</b>	<b>5,486.6</b>	<b>200.5</b>	<b>5,687.1</b>	<b>4,171.6</b>	<b>6,199.2</b>	<b>512.1</b>
<b>SFOBB West Approach Replacement</b>						
Capital Outlay Support	120.0	(3.0)	117.0	117.3	118.0	1.0
Capital Outlay Construction	309.0	41.7	350.7	328.0	338.1	(12.6)
<b>Total</b>	<b>429.0</b>	<b>38.7</b>	<b>467.7</b>	<b>445.3</b>	<b>456.1</b>	<b>(11.6)</b>
<b>SFOBB West Span Retrofit</b>						
Capital Outlay Support	75.0	-	75.0	74.8	75.0	-
Capital Outlay Construction	232.9	-	232.9	227.3	227.5	(5.4)
<b>Total</b>	<b>307.9</b>	<b>-</b>	<b>307.9</b>	<b>302.1</b>	<b>302.5</b>	<b>(5.4)</b>
<b>Richmond-San Rafael Bridge Retrofit</b>						
Capital Outlay Support	134.0	(7.0)	127.0	126.7	127.0	-
Capital Outlay Construction	780.0	(90.5)	689.5	667.5	689.5	-
<b>Total</b>	<b>914.0</b>	<b>(97.5)</b>	<b>816.5</b>	<b>794.2</b>	<b>816.5</b>	<b>-</b>
<b>Benicia-Martinez Bridge Retrofit</b>						
Capital Outlay Support	38.1	-	38.1	38.1	38.1	-
Capital Outlay Construction	139.7	-	139.7	139.7	139.7	-
<b>Total</b>	<b>177.8</b>	<b>-</b>	<b>177.8</b>	<b>177.8</b>	<b>177.8</b>	<b>-</b>
<b>Carquinez Bridge Retrofit</b>						
Capital Outlay Support	28.7	-	28.7	28.8	28.7	-
Capital Outlay Construction	85.5	-	85.5	85.4	85.5	-
<b>Total</b>	<b>114.2</b>	<b>-</b>	<b>114.2</b>	<b>114.2</b>	<b>114.2</b>	<b>-</b>
<b>San Mateo-Hayward Bridge Retrofit</b>						
Capital Outlay Support	28.1	-	28.1	28.1	28.1	-
Capital Outlay Construction	135.4	-	135.4	135.3	135.4	-
<b>Total</b>	<b>163.5</b>	<b>-</b>	<b>163.5</b>	<b>163.4</b>	<b>163.5</b>	<b>-</b>
<b>Vincent Thomas Bridge Retrofit (Los Angeles)</b>						
Capital Outlay Support	16.4	-	16.4	16.4	16.4	-
Capital Outlay Construction	42.1	-	42.1	42.0	42.1	-
<b>Total</b>	<b>58.5</b>	<b>-</b>	<b>58.5</b>	<b>58.4</b>	<b>58.5</b>	<b>-</b>
<b>San Diego-Coronado Bridge Retrofit</b>						
Capital Outlay Support	33.5	-	33.5	33.2	33.5	-
Capital Outlay Construction	70.0	-	70.0	69.4	70.0	-
<b>Total</b>	<b>103.5</b>	<b>-</b>	<b>103.5</b>	<b>102.6</b>	<b>103.5</b>	<b>-</b>

Note: Details may not sum to totals due to rounding effects.

## Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 (\$ Millions) (cont.)

Contract a	AB 144 / SB 66 Budget (07/2005) c	Approved Changes d	Current Approved Budget (04/2010) e = c + d	Cost To Date (04/2010) f	Cost Forecast (04/2010) g	At- Completion Variance h = g - e
<b>Antioch Bridge</b>						
Capital Outlay Support	-	39.0	39.0	9.2	31.0	(8.0)
Capital Outlay Support by BATA				6.2		
Capital Outlay Construction	-	156.0	156.0	-	70.0	(86.0)
<b>Total</b>	<b>-</b>	<b>195.0</b>	<b>195.0</b>	<b>15.4</b>	<b>101.0</b>	<b>(94.0)</b>
<b>Dumbarton Bridge</b>						
Capital Outlay Support	-	95.0	95.0	15.4	103.1	8.1
Capital Outlay Support by BATA				6.0		
Capital Outlay Construction	-	270.0	270.0	0.3	171.9	(98.1)
<b>Total</b>	<b>-</b>	<b>365.0</b>	<b>365.0</b>	<b>21.7</b>	<b>275.0</b>	<b>(90.0)</b>
<b>Subtotal Capital Outlay Support</b>	<b>1,433.1</b>	<b>124.0</b>	<b>1,557.1</b>	<b>1,335.9</b>	<b>1,861.1</b>	<b>304.0</b>
<b>Subtotal Capital Outlay</b>	<b>6,286.8</b>	<b>581.0</b>	<b>6,867.8</b>	<b>5,030.1</b>	<b>6,899.0</b>	<b>31.2</b>
<b>Subtotal Other Budgeted Capital</b>	<b>35.1</b>	<b>(3.3)</b>	<b>31.8</b>	<b>0.7</b>	<b>7.7</b>	<b>(24.1)</b>
<b>Miscellaneous Program Costs</b>	<b>30.0</b>	<b>-</b>	<b>30.0</b>	<b>24.8</b>	<b>30.0</b>	<b>-</b>
<b>Subtotal Toll Bridge Seismic Retrofit Program</b>	<b>7,785.0</b>	<b>701.7</b>	<b>8,486.7</b>	<b>6,391.5</b>	<b>8,797.8</b>	<b>311.1</b>
<b>Programmatic Risk</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>78.0</b>	<b>78.0</b>
<b>Program Contingency</b>	<b>900.0</b>	<b>48.3</b>	<b>948.3</b>	<b>-</b>	<b>422.2</b>	<b>(526.1)</b>
<b>Total Toll Bridge Seismic Retrofit Program</b>	<b>8,685.0</b>	<b>750.0</b>	<b>9,435.0</b>	<b>6,391.5</b>	<b>9,298.0</b>	<b>(137.0)</b>



## Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 (\$ Millions)

Bridge	Expenditures to date and Encumbrances			Estimated Cost not yet Spent or Encumbered		Total Forecast as of Apr 2010
	AB 144 Baseline Budget	TBPOC Current Approved Budget	as of Apr 2010 See Note (1)	as of Apr 2010		
a	b	c	d	e		f = d + e
Other Completed Projects						
Capital Outlay Support	144.9	144.9	144.6	0.2		144.8
Capital Outlay	472.6	472.6	472.6	0.1		472.7
Total	617.5	617.5	617.2	0.3		617.5
Richmond-San Rafael						
Capital Outlay Support	134.0	127.0	126.7	0.3		127.0
Capital Outlay	698.0	689.5	674.1	15.4		689.5
Project Reserves	82.0	-	-	-		-
Total	914.0	816.5	800.8	15.7		816.5
West Span Retrofit						
Capital Outlay Support	75.0	75.0	74.8	0.2		75.0
Capital Outlay	232.9	232.9	232.8	(5.3)		227.5
Total	307.9	307.9	307.6	(5.1)		302.5
West Approach						
Capital Outlay Support	120.0	117.0	118.1	(0.1)		118.0
Capital Outlay	309.0	350.7	342.5	(4.4)		338.1
Total	429.0	467.7	460.6	(4.5)		456.1
SFOBB East Span -Skyway						
Capital Outlay Support	197.0	181.2	181.3	(0.1)		181.2
Capital Outlay	1,293.0	1,254.1	1,368.4	(114.3)		1,254.1
Total	1,490.0	1,435.3	1,549.7	(114.4)		1,435.3
SFOBB East Span -SAS- Superstructure						
Capital Outlay Support	214.6	214.6	225.9	234.1		460.0
Capital Outlay	1,753.7	1,753.7	1,649.6	341.8		1,991.4
Total	1,968.3	1,968.3	1,875.5	575.9		2,451.4
SFOBB East Span -SAS- Foundations						
Capital Outlay Support	62.5	37.6	37.6	-		37.6
Capital Outlay	339.9	307.3	308.7	(1.4)		307.3
Total	402.4	344.9	346.3	(1.4)		344.9
Small YBI Projects						
Capital Outlay Support	10.6	10.6	10.1	0.5		10.6
Capital Outlay	15.6	15.6	16.6	(0.9)		15.7
Total	26.2	26.2	26.7	(0.4)		26.3
YBI Detour						
Capital Outlay Support	29.5	84.5	81.9	7.3		89.2
Capital Outlay	131.9	492.9	493.0	(6.7)		486.3
Total	161.4	577.4	574.9	0.6		575.5
YBI - Transition Structures						
Capital Outlay Support	78.7	78.8	16.4	103.6		120.0
Capital Outlay	299.4	206.3	126.6	93.6		220.2
Total	378.1	285.1	143.0	197.2		340.2

Note: Details may not sum to totals due to rounding effects.

Notes: \* Budget for Richmond-San Rafael Bridge includes \$16.9 million of deck joint rehabilitation work that is considered to be eligible for seismic retrofit program funding.

## Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 (\$ Millions) (continued)

Bridge	Expenditures to date and Encumbrances			Estimated Cost not yet Spent or Encumbered	
	AB 144 Baseline Budget	TBPOC Current Approved Budget	as of Apr 2010 See Note (1)	as of Apr 2010	Total Forecast as of Apr 2010
a	b	c	d	e	f = d + e
Oakland Touchdown					
Capital Outlay Support	74.4	84.6	75.4	19.8	95.2
Capital Outlay	283.8	288.0	218.0	65.0	283.0
Total	358.2	372.6	293.4	84.8	378.2
East Span Other Small Project					
Capital Outlay Support	212.3	206.5	212.4	(5.8)	206.6
Capital Outlay	170.8	170.8	94.0	52.6	146.6
Total	383.1	377.3	306.4	46.8	353.2
Existing Bridge Demolition					
Capital Outlay Support	79.7	60.9	0.4	61.4	61.8
Capital Outlay	239.2	239.1	-	232.4	232.4
Total	318.9	300.0	0.4	293.8	294.2
Antioch Bridge					
Capital Outlay Support	-	39.0	9.4	15.4	24.8
Capital Outlay Support by BATA			6.2	-	6.2
Capital Outlay	-	156.0	47.0	23.0	70.0
Total	-	195.0	62.6	38.4	101.0
Dumbarton Bridge					
Capital Outlay Support	-	95.0	15.2	81.9	97.1
Capital Outlay Support by BATA			6.0	-	6.0
Capital Outlay	-	270.0	0.3	171.6	171.9
Total	-	365.0	21.5	253.5	275.0
Miscellaneous Program Costs	30.0	30.0	25.2	4.8	30.0
Total Capital Outlay Support (2)	1,463.2	1,587.2	1,367.6	523.5	1,891.1
Total Capital Outlay	6,321.8	6,899.5	6,044.2	862.5	6,906.7
Program Total	7,785.0	8,486.7	7,411.8	1,386.0	8,797.8

(1). Funds allocated to project or contract for Capital Outlay and Support needs includes Capital Outlay Support total allocation for FY 06/07.

(2). BSA provided a distribution of program contingency in December 2004 based on Bechtel Infrastructure Corporation input.

This column is subject to revision upon completion of Department's risk assessment update.

(3). Total Capital Outlay Support includes program indirect costs.



## Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 (\$ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (04/2010)	Cost To Date (04/2010)	Cost Forecast (04/2010)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>San Francisco-Oakland Bay Bridge East Span Replacement</b>						
<b>East Span - SAS Superstructure</b>						
Capital Outlay Support	214.6	-	214.6	221.8	460.0	245.4
Capital Outlay Construction	1,753.7	-	1,753.7	1,021.2	1,991.4	237.7
<b>Total</b>	<b>1,968.3</b>	<b>-</b>	<b>1,968.3</b>	<b>1,243.0</b>	<b>2,451.4</b>	<b>483.1</b>
<b>SAS W2 Foundations</b>						
Capital Outlay Support	10.0	(0.8)	9.2	9.2	9.2	-
Capital Outlay Construction	26.4	-	26.4	25.8	26.4	-
<b>Total</b>	<b>36.4</b>	<b>(0.8)</b>	<b>35.6</b>	<b>35.0</b>	<b>35.6</b>	<b>-</b>
<b>YBI South/South Detour</b>						
Capital Outlay Support	29.4	55.1	84.5	81.4	89.2	4.7
Capital Outlay Construction	132.0	360.9	492.9	436.0	486.3	(6.6)
<b>Total</b>	<b>161.4</b>	<b>416.0</b>	<b>577.4</b>	<b>517.4</b>	<b>575.5</b>	<b>(1.9)</b>
<b>East Span - Skyway</b>						
Capital Outlay Support	197.0	(15.8)	181.2	181.2	181.2	-
Capital Outlay Construction	1,293.0	(38.9)	1,254.1	1,236.9	1,254.1	-
<b>Total</b>	<b>1,490.0</b>	<b>(54.7)</b>	<b>1,435.3</b>	<b>1,418.1</b>	<b>1,435.3</b>	<b>-</b>
<b>East Span - SAS E2/T1 Foundations</b>						
Capital Outlay Support	52.5	(24.1)	28.4	28.4	28.4	-
Capital Outlay Construction	313.5	(32.6)	280.9	274.8	280.9	-
<b>Total</b>	<b>366.0</b>	<b>(56.7)</b>	<b>309.3</b>	<b>303.2</b>	<b>309.3</b>	<b>-</b>
<b>YBI Transition Structures (see notes below)</b>						
Capital Outlay Support	78.7	0.1	78.8	31.0	120.0	41.2
Capital Outlay Construction	299.3	(93.0)	206.3	1.8	220.2	13.9
<b>Total</b>	<b>378.0</b>	<b>(92.9)</b>	<b>285.1</b>	<b>32.8</b>	<b>340.2</b>	<b>55.1</b>
<b>* YBI- Transition Structures (Prior to Split Costs)</b>						
Capital Outlay Support			16.7	16.4	16.5	(0.2)
Capital Outlay Construction			-	-	-	-
<b>Total</b>			<b>16.7</b>	<b>16.4</b>	<b>16.5</b>	<b>(0.2)</b>
<b>* YBI- Transition Structures Contract No. 1</b>						
Capital Outlay Support			45.1	10.2	69.7	24.7
Capital Outlay Construction			144.0	1.8	156.9	12.9
<b>Total</b>			<b>189.1</b>	<b>12.0</b>	<b>226.6</b>	<b>37.6</b>
<b>* YBI- Transition Structures Contract No. 2</b>						
Capital Outlay Support			16.0	4.3	32.8	16.8
Capital Outlay Construction			59.0	-	60.0	1.0
<b>Total</b>			<b>75.0</b>	<b>4.3</b>	<b>92.8</b>	<b>17.8</b>
<b>* YBI- Transition Structures Contract No. 3 Landscape</b>						
Capital Outlay Support			1.0	-	1.0	-
Capital Outlay Construction			3.3	-	3.3	-
<b>Total</b>			<b>4.3</b>	<b>-</b>	<b>4.3</b>	<b>-</b>

Note: Details may not sum to totals due to rounding effects.

## Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 (\$ Millions) (continued)

Contract a	AB 144 / SB 66 Budget (07/2005) c	Approved Changes d	Current Approved Budget (04/2010) e = c + d	Cost To Date (04/2010) f	Cost Forecast (04/2010) g	At-Completion Variance h = g - e
<b>Oakland Touchdown (see notes below)</b>						
Capital Outlay Support	74.4	10.2	84.6	74.4	95.2	10.6
Capital Outlay Construction	283.8	4.2	288.0	207.4	283.0	(5.0)
<b>Total</b>	<b>358.2</b>	<b>14.4</b>	<b>372.6</b>	<b>281.8</b>	<b>378.2</b>	<b>5.6</b>
<b>* OTD Prior-to-Split Costs</b>						
Capital Outlay Support			21.0	20.1	21.7	0.7
Capital Outlay Construction			-	-	-	-
<b>Total</b>			<b>21.0</b>	<b>20.1</b>	<b>21.7</b>	<b>0.7</b>
<b>* OTD Submarine Cable</b>						
Capital Outlay Support			0.9	0.9	0.9	-
Capital Outlay Construction			9.6	7.9	9.6	-
<b>Total</b>			<b>10.5</b>	<b>8.8</b>	<b>10.5</b>	<b>-</b>
<b>* OTD No. 1 (Westbound)</b>						
Capital Outlay Support			45.5	46.1	47.6	2.1
Capital Outlay Construction			212.0	199.5	211.2	(0.8)
<b>Total</b>			<b>257.5</b>	<b>245.6</b>	<b>258.8</b>	<b>1.3</b>
<b>* OTD No. 2 (Eastbound)</b>						
Capital Outlay Support			15.8	6.6	23.5	7.7
Capital Outlay Construction			62.0	-	57.8	(4.2)
<b>Total</b>			<b>77.8</b>	<b>6.6</b>	<b>81.3</b>	<b>3.5</b>
<b>* OTD Electrical Systems</b>						
Capital Outlay Support			1.4	0.8	1.5	0.1
Capital Outlay Construction			4.4	-	4.4	-
<b>Total</b>			<b>5.8</b>	<b>0.8</b>	<b>5.9</b>	<b>0.1</b>
<b>Existing Bridge Demolition</b>						
Capital Outlay Support	79.7	(18.8)	60.9	0.4	61.8	0.9
Capital Outlay Construction	239.2	(0.1)	239.1	-	232.4	(6.7)
<b>Total</b>	<b>318.9</b>	<b>(18.9)</b>	<b>300.0</b>	<b>0.4</b>	<b>294.2</b>	<b>(5.8)</b>
<b>YBI/SAS Archeology</b>						
Capital Outlay Support	1.1	-	1.1	1.1	1.1	-
Capital Outlay Construction	1.1	-	1.1	1.1	1.1	-
<b>Total</b>	<b>2.2</b>	<b>-</b>	<b>2.2</b>	<b>2.2</b>	<b>2.2</b>	<b>-</b>
<b>YBI - USCG Road Relocation</b>						
Capital Outlay Support	3.0	-	3.0	2.7	3.0	-
Capital Outlay Construction	3.0	-	3.0	2.8	3.0	-
<b>Total</b>	<b>6.0</b>	<b>-</b>	<b>6.0</b>	<b>5.5</b>	<b>6.0</b>	<b>-</b>
<b>YBI - Substation and Viaduct</b>						
Capital Outlay Support	6.5	-	6.5	6.4	6.5	-
Capital Outlay Construction	11.6	-	11.6	11.3	11.6	-
<b>Total</b>	<b>18.1</b>	<b>-</b>	<b>18.1</b>	<b>17.7</b>	<b>18.1</b>	<b>-</b>
<b>Oakland Geofill</b>						
Capital Outlay Support	2.5	-	2.5	2.5	2.5	-
Capital Outlay Construction	8.2	-	8.2	8.2	8.2	-
<b>Total</b>	<b>10.7</b>	<b>-</b>	<b>10.7</b>	<b>10.7</b>	<b>10.7</b>	<b>-</b>

Note: Details may not sum to totals due to rounding effects.



## Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through April 30, 2010 (\$ Millions) (continued)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (04/2010)	Cost To Date (04/2010)	Cost Forecast (04/2010)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>Pile Installation Demonstration Project</b>						
Capital Outlay Support	1.8	-	1.8	1.8	1.8	-
Capital Outlay Construction	9.2	-	9.2	9.2	9.2	-
<b>Total</b>	<b>11.0</b>	<b>-</b>	<b>11.0</b>	<b>11.0</b>	<b>11.0</b>	<b>-</b>
<b>Stormwater Treatment Measures</b>						
Capital Outlay Support	6.0	2.2	8.2	8.1	8.2	-
Capital Outlay Construction	15.0	3.3	18.3	16.7	18.3	-
<b>Total</b>	<b>21.0</b>	<b>5.5</b>	<b>26.5</b>	<b>24.8</b>	<b>26.5</b>	<b>-</b>
<b>Right-of-Way and Environmental Mitigation</b>						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay & Right-of-Way	72.4	-	72.4	51.2	72.4	-
<b>Total</b>	<b>72.4</b>	<b>-</b>	<b>72.4</b>	<b>51.2</b>	<b>72.4</b>	<b>-</b>
<b>Sunk Cost - Existing East Span Retrofit</b>						
Capital Outlay Support	39.5	-	39.5	39.5	39.5	-
Capital Outlay Construction	30.8	-	30.8	30.8	30.8	-
<b>Total</b>	<b>70.3</b>	<b>-</b>	<b>70.3</b>	<b>70.3</b>	<b>70.3</b>	<b>-</b>
<b>Other Capital Outlay Support</b>						
Environmental Phase	97.7	-	97.7	97.7	97.7	-
Pre-Split Project Expenditures	44.9	-	44.9	44.9	44.9	-
Non-project Specific Costs	20.0	(8.0)	12.0	3.2	12.0	-
<b>Total</b>	<b>162.6</b>	<b>(8.0)</b>	<b>154.6</b>	<b>145.8</b>	<b>154.6</b>	<b>-</b>
<b>Subtotal Capital Outlay Support</b>	<b>959.3</b>	<b>-</b>	<b>959.3</b>	<b>835.7</b>	<b>1,262.2</b>	<b>302.9</b>
<b>Subtotal Capital Outlay Construction</b>	<b>4,492.2</b>	<b>203.8</b>	<b>4,696.0</b>	<b>3,335.2</b>	<b>4,929.3</b>	<b>233.3</b>
<b>Other Budgeted Capital</b>	<b>35.1</b>	<b>(3.3)</b>	<b>31.8</b>	<b>0.7</b>	<b>7.7</b>	<b>(24.1)</b>
						<b>-</b>
<b>Total SFOBB East Span Replacement Project</b>	<b>5,486.6</b>	<b>200.5</b>	<b>5,687.1</b>	<b>4,171.6</b>	<b>6,199.2</b>	<b>512.1</b>

## Appendix C: Regional Measure 1 Program Cost Detail (\$ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (04/2010)	Cost To Date (04/2010)	Cost Forecast (04/2010)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>New Benicia-Martinez Bridge Project</b>						
<b>New Bridge</b>						
Capital Outlay Support						
BATA Funding	84.9	6.9	91.8	91.8	91.8	-
Non-BATA Funding	-	0.1	0.1	0.1	0.1	-
Subtotal	84.9	7.0	91.9	91.9	91.9	-
Capital Outlay Construction			-			-
BATA Funding	661.9	94.6	756.5	753.8	756.5	-
Non-BATA Funding	10.1	-	10.1	10.1	10.1	-
Subtotal	672.0	94.6	766.6	763.9	766.6	-
<b>Total</b>	<b>756.9</b>	<b>101.6</b>	<b>858.5</b>	<b>855.8</b>	<b>858.5</b>	<b>-</b>
<b>I-680/I-780 Interchange Reconstruction</b>						
Capital Outlay Support						
BATA Funding	24.9	5.2	30.1	30.1	30.1	-
Non-BATA Funding	1.4	5.2	6.6	6.3	6.6	-
Subtotal	26.3	10.4	36.7	36.4	36.7	-
Capital Outlay Construction						
BATA Funding	54.7	26.9	81.6	77.1	81.6	-
Non-BATA Funding	21.6	-	21.6	21.7	21.7	0.1
Subtotal	76.3	26.9	103.2	98.8	103.3	0.1
<b>Total</b>	<b>102.6</b>	<b>37.3</b>	<b>139.9</b>	<b>135.2</b>	<b>140.0</b>	<b>0.1</b>
<b>I-680/Marina Vista Interchange Reconstruction</b>						
Capital Outlay Support	18.3	1.8	20.1	20.2	20.2	0.1
Capital Outlay Construction	51.5	4.9	56.4	56.1	56.4	-
<b>Total</b>	<b>69.8</b>	<b>6.7</b>	<b>76.5</b>	<b>76.3</b>	<b>76.6</b>	<b>0.1</b>
<b>New Toll Plaza and Administration Building</b>						
Capital Outlay Support	11.9	3.8	15.7	15.7	15.7	-
Capital Outlay Construction	24.3	2.0	26.3	25.1	26.3	-
<b>Total</b>	<b>36.2</b>	<b>5.8</b>	<b>42.0</b>	<b>40.8</b>	<b>42.0</b>	<b>-</b>
<b>Existing Bridge &amp; Interchange Modifications</b>						
Capital Outlay Support						
BATA Funding	4.3	13.5	17.8	17.8	17.8	-
Non-BATA Funding	-	0.9	0.9	0.8	0.9	-
Subtotal	4.3	14.4	18.7	18.6	18.7	-
Capital Outlay Construction						
BATA Funding	17.2	32.8	50.0	37.0	50.0	-
Non-BATA Funding	-	9.5	9.5	-	9.5	-
Subtotal	17.2	42.3	59.5	37.0	59.5	-
<b>Total</b>	<b>21.5</b>	<b>56.7</b>	<b>78.2</b>	<b>55.6</b>	<b>78.2</b>	<b>-</b>
<b>Other Contracts</b>						
Capital Outlay Support	11.4	(2.3)	9.1	9.0	9.1	-
Capital Outlay Construction	20.3	3.3	23.6	17.7	23.6	-
Capital Outlay Right-of-Way	20.4	(0.1)	20.3	17.0	20.3	-
<b>Total</b>	<b>52.1</b>	<b>0.9</b>	<b>53.0</b>	<b>43.7</b>	<b>53.0</b>	<b>-</b>

Note: Details may not sum to totals due to rounding effects.



## Appendix C: Regional Measure 1 Program Cost Detail (\$ Millions) (Continued)

	AB 144 / SB		Current			
Contract	66 Budget	Approved	Approved	Cost To Date	Cost	At-
a	(07/2005)	Changes	Budget	(04/2010)	Forecast	Completion
	c	d	e = c + d	f	g	h = g - e
New Benicia-Martinez Bridge Project continued...						
Subtotal BATA Capital Outlay Support	155.7	28.9	184.6	184.6	184.7	0.1
Subtotal BATA Capital Outlay Construction	829.9	164.5	994.4	966.8	994.4	-
Subtotal Capital Outlay Right-of-Way	20.4	(0.1)	20.3	17.0	20.3	-
Subtotal Non-BATA Capital Outlay Support	1.4	6.2	7.6	7.2	7.6	-
Subtotal Non-BATA Capital Outlay Construction	31.7	9.5	41.2	31.8	41.3	0.1
Project Reserves	20.8	3.6	24.4	-	24.2	(0.2)
Total New Benicia-Martinez Bridge Project	1,059.9	212.6	1,272.5	1,207.4	1,272.5	-
Notes:	Includes EA's 00601_,00603_,00605_,00606_, 00608_, 00609_, 0060A_, 0060C_, 0060E_, 0060F_, 0060G_, and 0060H_ and all Project Right-of-Way					
Carquinez Bridge Replacement Project						
New Bridge						
Capital Outlay Support	60.5	(0.3)	60.2	60.2	60.2	-
Capital Outlay Construction	253.3	2.7	256.0	255.9	256.0	-
Total	313.8	2.4	316.2	316.1	316.2	-
Crockett Interchange Reconstruction						
Capital Outlay Support	32.0	(0.1)	31.9	31.9	31.9	-
Capital Outlay Construction	73.9	(1.9)	72.0	71.9	72.0	-
Total	105.9	(2.0)	103.9	103.8	103.9	-
Existing 1927 Bridge Demolition						
Capital Outlay Support	16.1	(0.5)	15.6	15.7	15.7	0.1
Capital Outlay Construction	35.2	-	35.2	34.8	35.2	-
Total	51.3	(0.5)	50.8	50.5	50.9	0.1
Other Contracts						
Capital Outlay Support	15.8	1.2	17.0	16.3	17.0	-
Capital Outlay Construction	18.8	(1.2)	17.6	16.2	17.6	-
Capital Outlay Right-of-Way	10.5	(0.1)	10.4	10.0	10.4	-
Total	45.1	(0.1)	45.0	42.5	45.0	-
Subtotal BATA Capital Outlay Support	124.4	0.3	124.7	124.1	124.8	0.1
Subtotal BATA Capital Outlay Construction	381.2	(0.4)	380.8	378.8	380.8	-
Subtotal Capital Outlay Right-of-Way	10.5	(0.1)	10.4	10.0	10.4	-
Project Reserves	12.1	(9.8)	2.3	-	2.2	(0.1)
Total Carquinez Bridge Replacement Project	528.2	(10.0)	518.2	512.9	518.2	-
Notes:	Other Contracts includes EA's 01301_,01302_, 01303_, 01304_,01305_, 01306_, 01307_, 01308_, 01309_,0130A_, 0130C_, 0130D_, 0130F_, 0130G_, 0130H_, 0130J_, 00453_, 00493_, 04700_, 00607_, 2A270_, and 29920_ and all Project Right-of-Way					

Note: Details may not sum to totals due to rounding effects.

## Appendix C: Regional Measure 1 Program Cost Detail (\$ Millions) (Continued)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (04/2010)	Cost To Date (04/2010)	Cost Forecast (04/2010)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>Richmond-San Rafael Bridge Trestle, Fender, and Deck Joint Rehabilitation</b> See note <sup>1</sup> below						
Capital Outlay Support						
BATA Funding	2.2	(0.8)	1.4	1.4	1.4	-
Non-BATA Funding	8.6	1.8	10.4	10.4	10.4	-
Subtotal	10.8	1.0	11.8	11.8	11.8	-
Capital Outlay Construction						
BATA Funding	40.2	(6.8)	33.4	33.3	33.4	-
Non-BATA Funding	51.1	-	51.1	51.1	51.1	-
Subtotal	91.3	(6.8)	84.5	84.4	84.5	-
Project Reserves	-	0.8	0.8	-	0.8	-
<b>Total</b>	<b>102.1</b>	<b>(5.0)</b>	<b>97.1</b>	<b>96.2</b>	<b>97.1</b>	<b>-</b>
<b>Richmond-San Rafael Bridge Deck Overlay Rehabilitation</b>						
Capital Outlay Support						
BATA Funding	4.0	(0.7)	3.3	3.3	3.3	-
Non-BATA Funding	4.0	(4.0)	-	-	-	-
Subtotal	8.0	(4.7)	3.3	3.3	3.3	-
Capital Outlay Construction	16.9	(0.6)	16.3	16.3	16.3	-
Project Reserves	0.1	0.3	0.4	-	0.4	-
<b>Total</b>	<b>25.0</b>	<b>(5.0)</b>	<b>20.0</b>	<b>19.6</b>	<b>20.0</b>	<b>-</b>
<b>Richmond Parkway Project (RM 1 Share Only)</b>						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay Construction	5.9	-	5.9	4.3	5.9	-
<b>Total</b>	<b>5.9</b>	<b>-</b>	<b>5.9</b>	<b>4.3</b>	<b>5.9</b>	<b>-</b>
<b>San Mateo-Hayward Bridge Widening</b>						
Capital Outlay Support	34.6	(0.5)	34.1	34.1	34.1	-
Capital Outlay Construction	180.2	(6.1)	174.1	174.1	174.1	-
Capital Outlay Right-of-Way	1.5	(0.9)	0.6	0.5	0.6	-
Project Reserves	1.5	(0.5)	1.0	-	1.0	-
<b>Total</b>	<b>217.8</b>	<b>(8.0)</b>	<b>209.8</b>	<b>208.7</b>	<b>209.8</b>	<b>-</b>
<b>I-880/SR-92 Interchange Reconstruction</b>						
Capital Outlay Support	28.8	34.6	63.4	53.1	63.4	-
Capital Outlay Construction						
BATA Funding	85.2	66.2	151.4	95.0	151.4	-
Non-BATA Funding	9.6	-	9.6	-	9.6	-
Subtotal	94.8	66.2	161.0	95.0	161.0	-
Capital Outlay Right-of-Way	9.9	7.0	16.9	12.1	16.9	-
Project Reserves	0.3	3.4	3.7	-	3.7	-
<b>Total</b>	<b>133.8</b>	<b>111.2</b>	<b>245.0</b>	<b>160.2</b>	<b>245.0</b>	<b>-</b>
<b>Bayfront Expressway Widening</b>						
Capital Outlay Support	8.6	(0.2)	8.4	8.3	8.4	-
Capital Outlay Construction	26.5	(1.5)	25.0	24.9	25.0	-
Capital Outlay Right-of-Way	0.2	-	0.2	0.2	0.2	-
Project Reserves	0.8	(0.3)	0.5	-	0.5	-
<b>Total</b>	<b>36.1</b>	<b>(2.0)</b>	<b>34.1</b>	<b>33.4</b>	<b>34.1</b>	<b>-</b>

Notes: <sup>2</sup>Details may not sum to totals due to rounding effects.

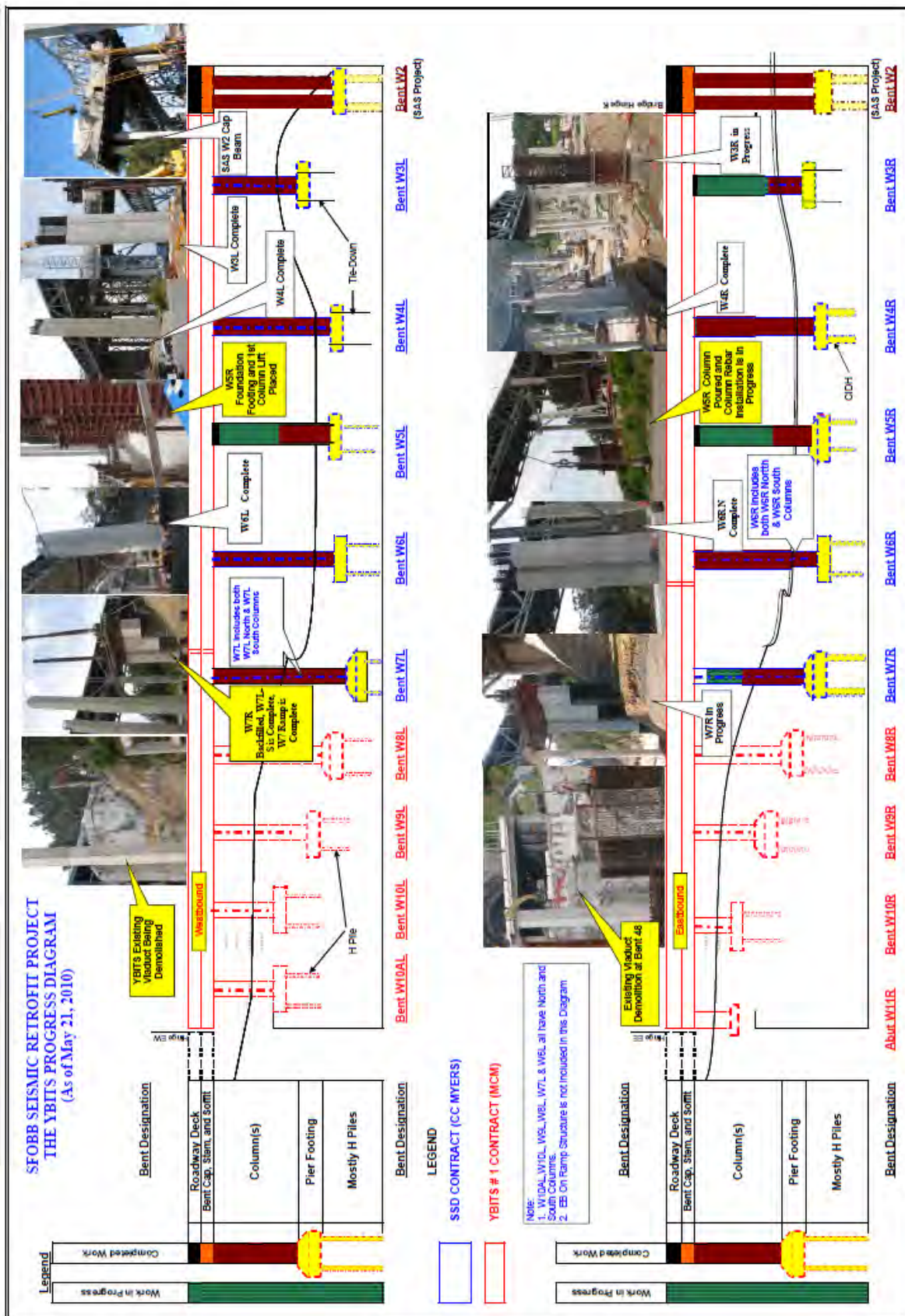


## Appendix C: Regional Measure 1 Program Cost Detail (\$ Millions) (Continued)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (04/2010)	Cost To Date (04/2010)	Cost Forecast (04/2010)	At- Completion Variance
a	c	d	e = c + d	f	g	h = g - e
<b>US 101/University Avenue Interchange Modification</b>						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay Construction	3.8	-	3.8	3.7	3.8	-
<b>Total</b>	<b>3.8</b>	<b>-</b>	<b>3.8</b>	<b>3.7</b>	<b>3.8</b>	<b>-</b>
Subtotal BATA Capital Outlay Support	358.3	61.6	419.9	408.9	420.1	0.2
Subtotal BATA Capital Outlay Construction	1,569.8	215.3	1,785.1	1,697.2	1,785.1	-
Subtotal Capital Outlay Right-of-Way	42.5	5.9	48.4	39.8	48.4	-
Subtotal Non-BATA Capital Outlay Support	14.0	4.0	18.0	17.6	18.0	-
Subtotal Non-BATA Capital Outlay Construction	92.4	9.5	101.9	82.9	102.0	0.1
Project Reserves	35.6	(2.5)	33.1	-	32.8	(0.3)
<b>Total RM1 Program</b>	<b>2,112.6</b>	<b>293.8</b>	<b>2,406.4</b>	<b>2,246.4</b>	<b>2,406.4</b>	<b>-</b>
<b>Notes:</b>						
1 Richmond-San Rafael Bridge Trestle, Fender, and Deck Joint Rehabilitation Includes Non-TBSRA Expenses for EA 0438U_ and 04157_						
2 San Mateo-Hayward Bridge Widening Includes EA's 00305_, 04501_, 04502_, 04503_, 04504_, 04505_, 04506_, 04507_, 04508_, 04509_, 27740_, 27790_, 04860_						

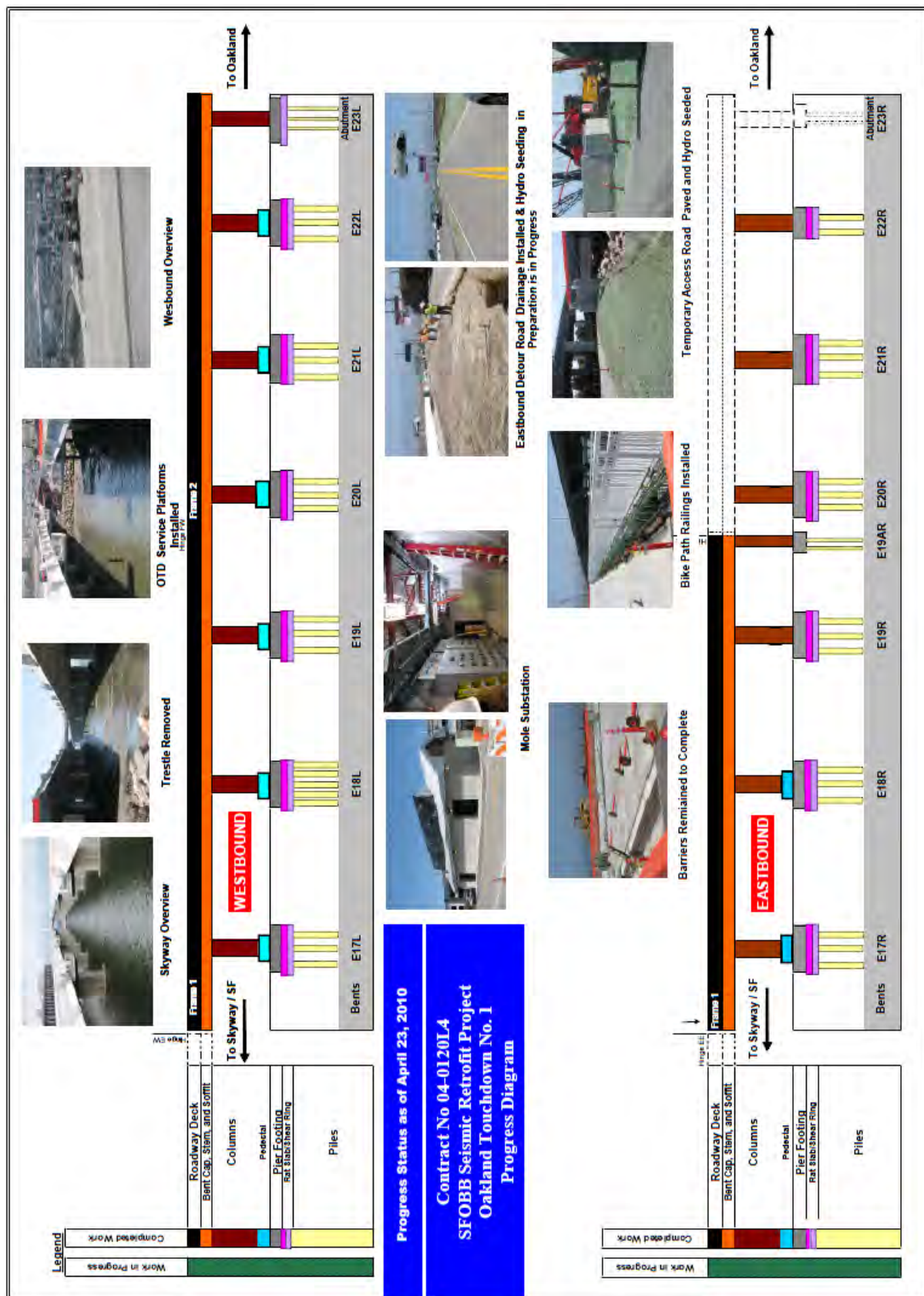
**Notes:** 2Details may not sum to totals due to rounding effects.

## Appendix D: YBITS Advanced Work Project Progress Diagram





# Appendix E: OTD #1 Program Diagram





## Appendix F: Project Progress Photographs

The Completed Skyway on Right and  
Existing Bridge on Far Left



## Appendix F: Project Progress Photographs

### Yerba Buena Island Detour Existing Bridge Demolition



Existing Bridge Demolition Progress on Left, Temporary Detour on Right and Left Coast Lifter Placing a Roadway Box onto the Temporary Structures





**Demolition of Bent 48**



**Close-up of Demolition of Bent 48**



## Appendix F: Project Progress Photographs

### Self-Anchored Suspension Bridge Fabrication



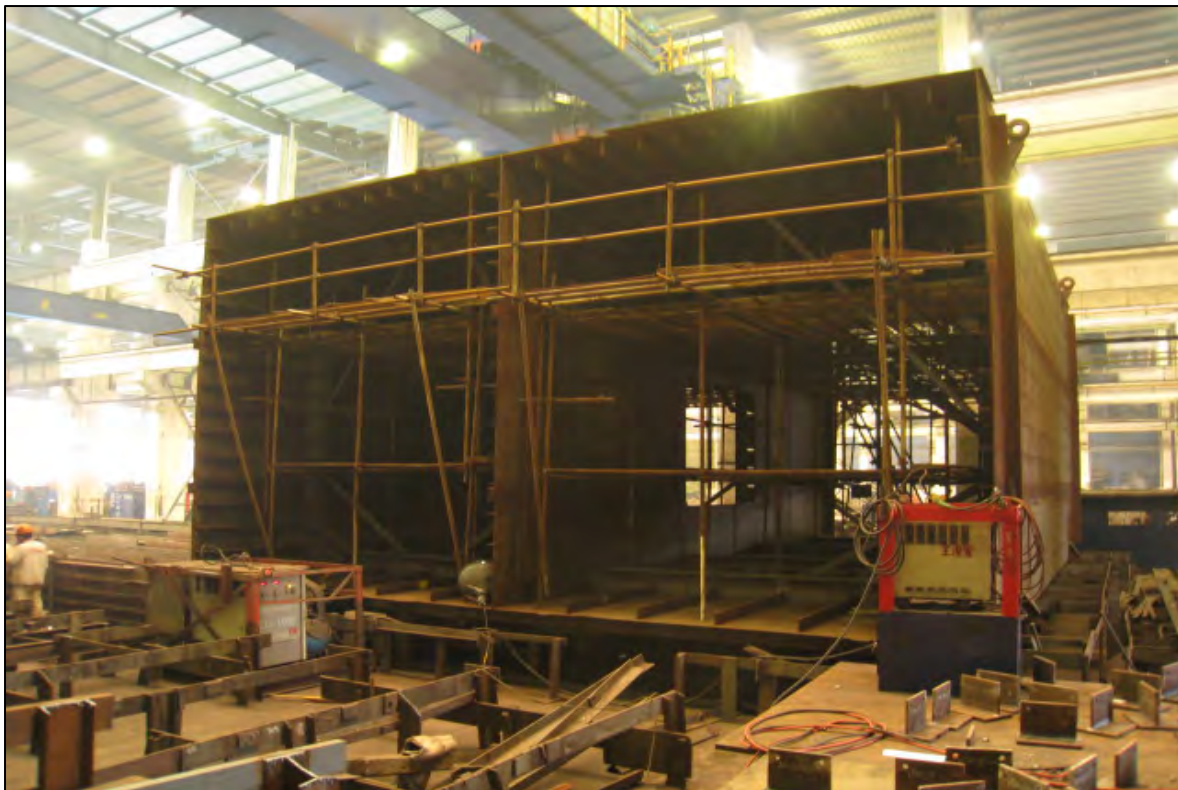
SAS - Welding of Shear Plate Type 2 Bearing Stiffeners



SAS - Tower Box 5 East and West Shafts



SAS - Internal Splice Plate Being Fitted to Skin D of Tower Box 4 East Shaft



SAS - Crossbeam 15 Assembly in Bay 1



## Appendix F: Project Progress Photographs

### Self-Anchored Suspension Bridge Field Work



SAS - Roadway Box 4 West Being Placed on Temporary Support Structures

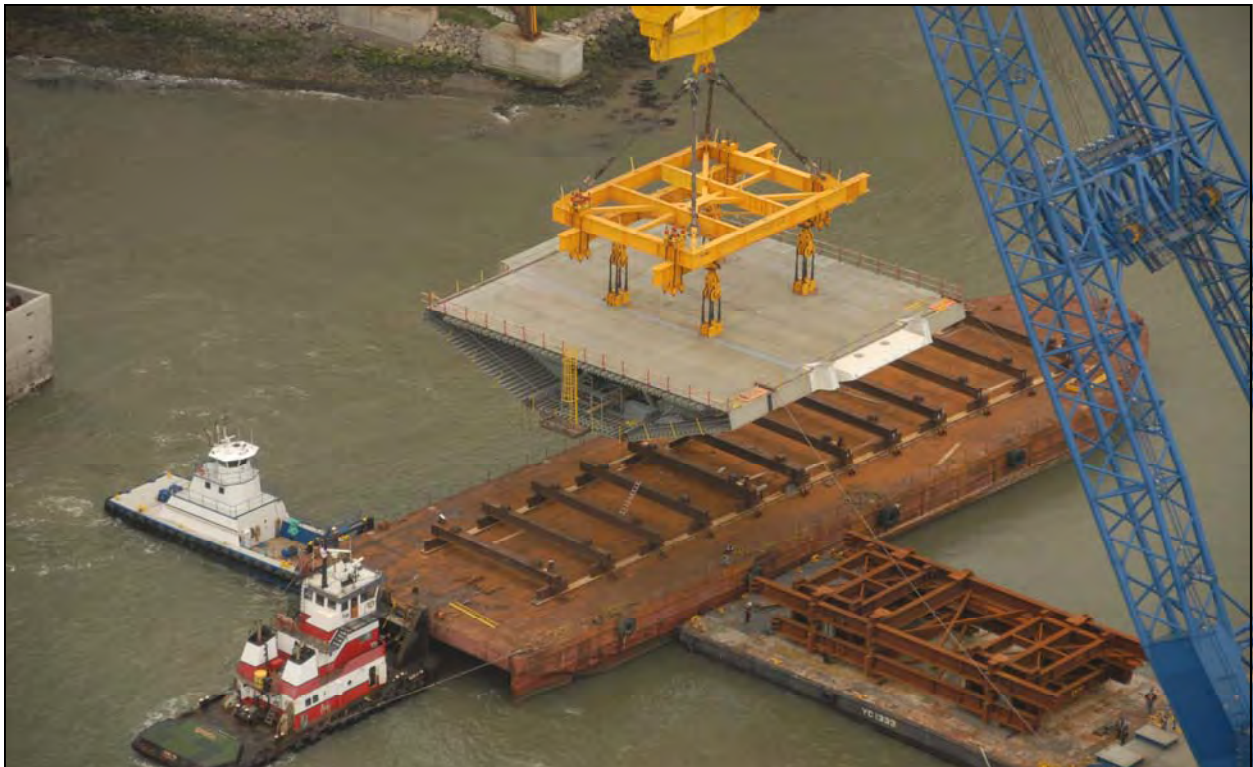


SAS - Roadway Boxes and Crossbeams Installed





SAS - Crossbeam # 3



SAS - Roadway Box 4 West Being Lifted onto the Temporary Support Structures



## Appendix F: Project Progress Photographs

### Self-Anchored Suspension Bridge Field Work (cont.)



SAS–Offloading Roadway Box 5 East



SAS - Offloading Roadway Box 5 East



SAS– Roadway Box 6 in Place and Temporary Tower Erection in Process



SAS– Edge Plate B and Side Plate









SAS - Eastbound Roadway  
Boxes Erected on Temporary  
Support Structures

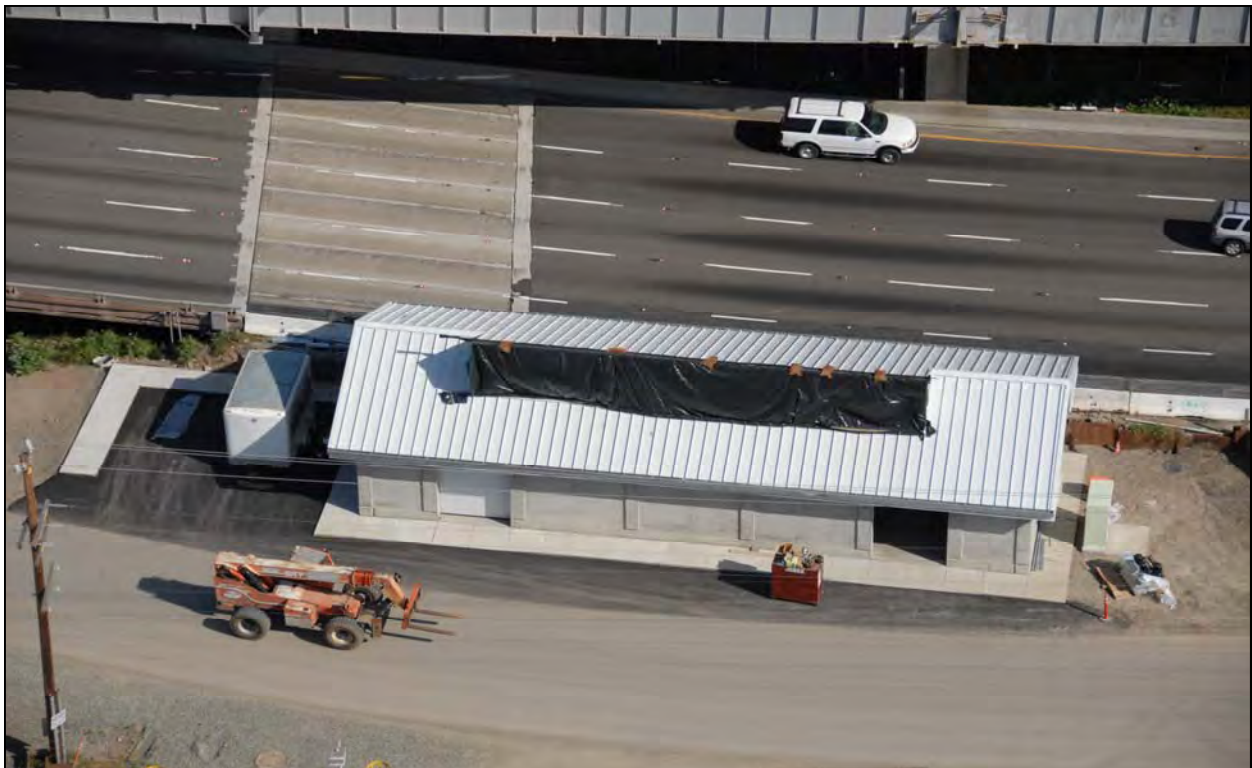


## Appendix F: Project Progress Photographs

### Oakland Touchdown



Oakland Touchdown #1 Overview of Completed Temporary Access Road OTD #1



Oakland Touchdown #1 Mole Substation Exterior Aerial View





Oakland Touchdown #1 Looking West



Oakland Touchdown #1 Looking East



## Appendix F: Project Progress Photographs

### 92/880 Interchange



92/880 Site Preparation of New Route 92 and Interstate 880 Separator



92/880 Widening at Mount Eden Overhead Crossing





92/880 Overview of Progress



92/880 Overview of Progress



## Appendix G: Glossary of Terms

**AB144/SB 66 BUDGET:** The planned allocation of resources for the Toll Bridge Seismic Retrofit Program, or subordinate projects or contracts, as provided in Assembly Bill 144 and Senate Bill 66, signed into law by Governor Schwarzenegger on July 18, 2005 and September 29, 2005, respectively.

**BATA BUDGET:** The planned allocation of resources for the Regional Measure 1 Program, or subordinate projects or contracts as authorized by the Bay Area Toll Authority as of June 2005.

**APPROVED CHANGES:** For cost, changes to the AB144/SB 66 Budget or BATA Budget as approved by the Bay Area Toll Authority Commission. For schedule, changes to the AB 144/SB 66 Project Complete Baseline approved by the Toll Bridge Program Oversight Committee, or changes to the BATA Project Complete Baseline approved by the Bay Area Toll Authority Commission.

**CURRENT APPROVED BUDGET:** The sum of the AB144/SB66 Budget or BATA Budget and Approved Changes.

**COST TO DATE:** The actual expenditures incurred by the program, project or contract as of the month and year shown.

**COST FORECAST:** The current forecast of all of the costs that are projected to be expended so as to complete the given scope of the program, project, or contract.

**AT COMPLETION VARIANCE or VARIANCE (cost):** The mathematical difference between the Cost Forecast and the Current Approved Budget.

**AB 144/SB 66 PROJECT COMPLETE BASELINE:** The planned completion date for the Toll Bridge Seismic Retrofit Program or subordinate projects or contracts.

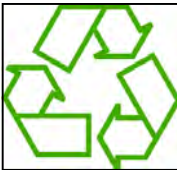
**BATA PROJECT COMPLETE BASELINE:** The planned completion date for the Regional Measure 1 Program or subordinate projects or contracts.

**PROJECT COMPLETE CURRENT APPROVED SCHEDULE:** The sum of the AB144/SB66 Project Complete Baseline or BATA Project Complete Baseline and Approved Changes.

**PROJECT COMPLETE SCHEDULE FORECAST:** The current projected date for the completion of the program, project, or contract.

**SCHEDULE VARIANCE or VARIANCE (schedule):** The mathematical difference expressed in months between the Project Complete Schedule Forecast and the Project Complete Current Approved Schedule.

**% COMPLETE:** % Complete is based on an evaluation of progress on the project, expenditures to date, and schedule.



100% Recyclable

This document, including the coil binding,  
is 100% recyclable

*The information in this report is provided in accordance with California Government code Section 755. This document is one of a series of reports prepared for the Bay Area Toll Authority (BATA)/Metropolitan Transportation Commission (MTC) for the Toll Bridge Seismic Retrofit and Regional Measure 1 Programs. The contract value for the monitoring efforts, technical analysis, and field site works that contribute to these reports, as well as the report preparation and production is \$1,574,873.73.*



